

# THE IRON AGE

THURSDAY, AUGUST 7, 1902.

## Some Special Tools at the Fore River Shipyard.

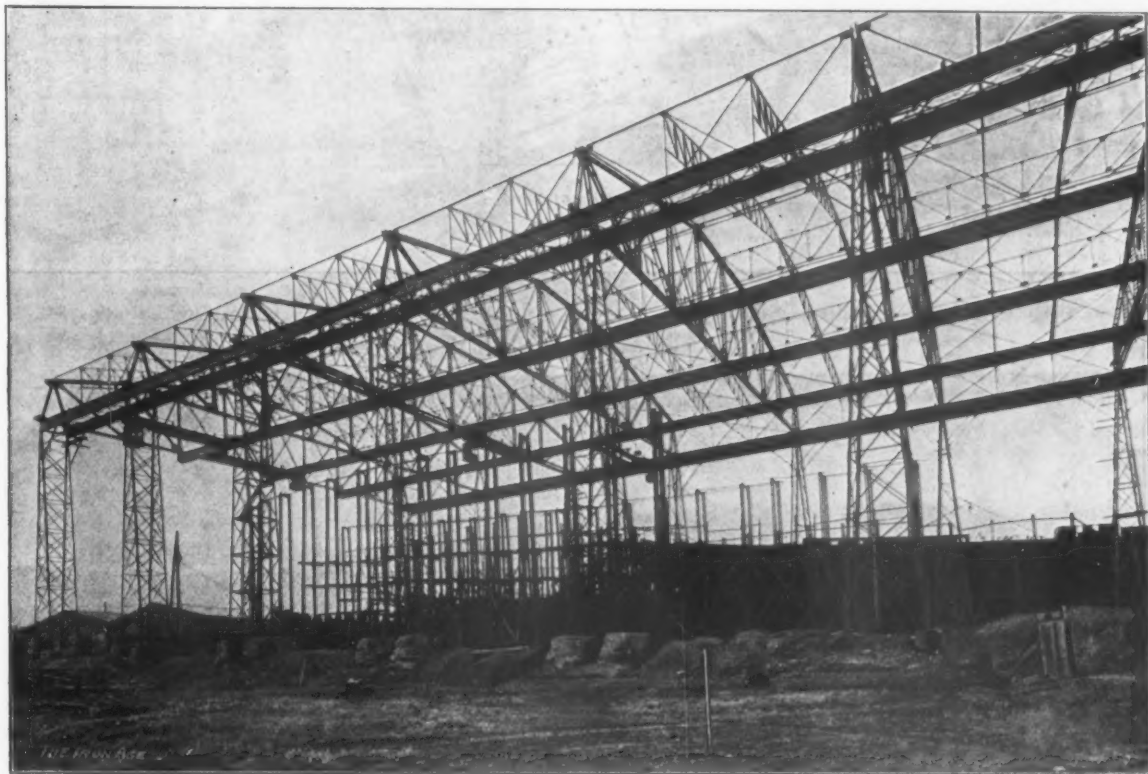
### Electricity and Compressed Air Used Throughout.

Those responsible for the equipment of the works of the Fore River Ship & Engine Company possessed one advantage of the greatest importance. All of the appliances, no matter of what description, and no matter of what value relatively, were to be new. There was absolutely no old and antiquated machinery for which space had to be provided. All of the buildings came under the same category, as the ground was free

for either steel or iron and castings are therefore obtained outside. A forge shop capable of turning out the heaviest and largest work, such as rudder frames and engine shafts, is an innovation as far as shipbuilding plants in the United States are concerned. This places the company in an independent position on all forge work, and gives them a great advantage in estimating for both new and repair work, as they can rely upon delivery in the time specified. Another unusual feature is an oil hardening outfit which will receive a shaft of the largest diameter and of any length up to 50 feet.

#### Location.

The works are located at Quincy, Mass., near Boston, and occupy 78 acres of land lying along the Weymouth



Ship House.

### ■ SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD. ■

of all incumbrance. These circumstances gave the designers a perfectly free rein and permitted them to construct and equip unhampered by any pre-existing conditions. The result is a shipyard admirably arranged for the quick and convenient handling of all material, from the raw stock to the finished product, and for the rapid placing of all parts on board the ship building. All this is made possible by the method of grouping the several buildings in relation to the shipways and by the employment of the most improved appliances for the handling and working of material.

In every way possible manual labor has been eliminated, electricity and compressed air being employed exclusively. All tools are electrically driven, individual motors being used in almost every instance. The yard is covered by standard gauge tracks, which are overlapped by trawling cranes wherever necessary. With a single exception the plant is capable of building every part and appliance entering a ship. There is no foundry

Fore River, upon which the grounds have a frontage of  $1\frac{1}{4}$  miles. Upon this site there are now 14 large buildings and a number of smaller ones, the inclosed floor area amounting to 11 acres.

From the accompanying map it will be noted that the power house is centrally located, as far as the various buildings are concerned. In this building are the electric generators, which supply current for nearly 200 motors, ranging in size from  $\frac{1}{2}$  to 10 horse-power, also for 165 arc lamps and about 2000 incandescent lamps. There are two independent units—one, termed the old plant, being intended to serve in an emergency. This consists of a 12 x 36 inch Corliss engine belted to a 65 kw. General Electric 240 volt direct current generator. An interesting fact is that this engine is one of the first built by Corliss—the date of its construction is not known exactly—and yet it still operates with high economy and gives perfect satisfaction. Another portion of this unit is composed of a 14 x 26 x

36 inch Hamilton-Corliss tandem compound engine belted to a Bullock generator of the same class as that just described. The new unit consists of a tandem compound Hamilton-Corliss engine direct connected to two 300 kw. General Electric generators.

In the same building is a large air compressor of the

#### Electrical Distribution.

Electrical distribution all through the plant is based upon a 240 volt, two-wire, direct current system, with some use of the multiple voltage system for speed variations. A four-wire system is used in connection with the latter, so that pressures of 45, 135 and 220 volts can

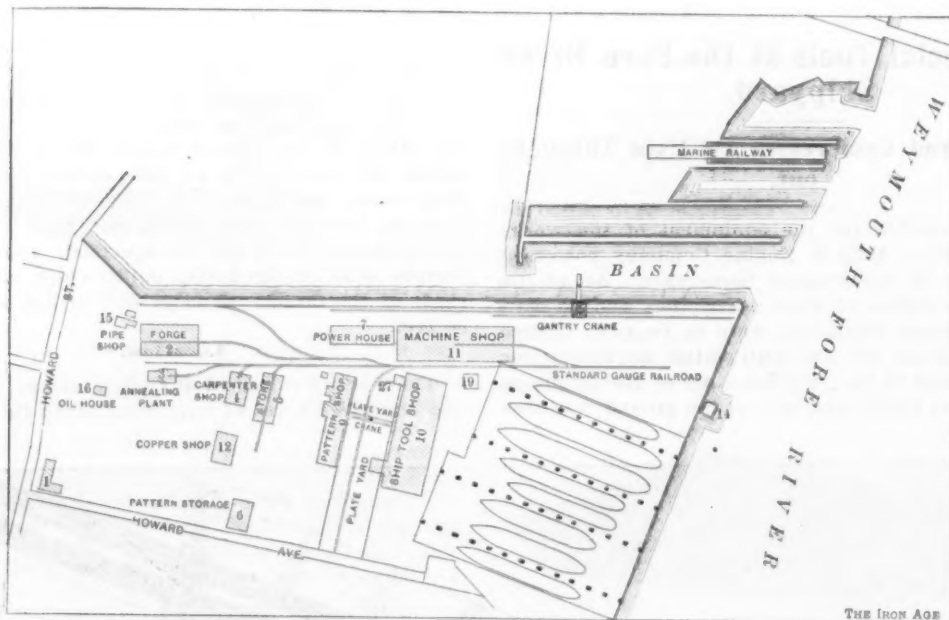


Fig. 2.—Map of Yard.

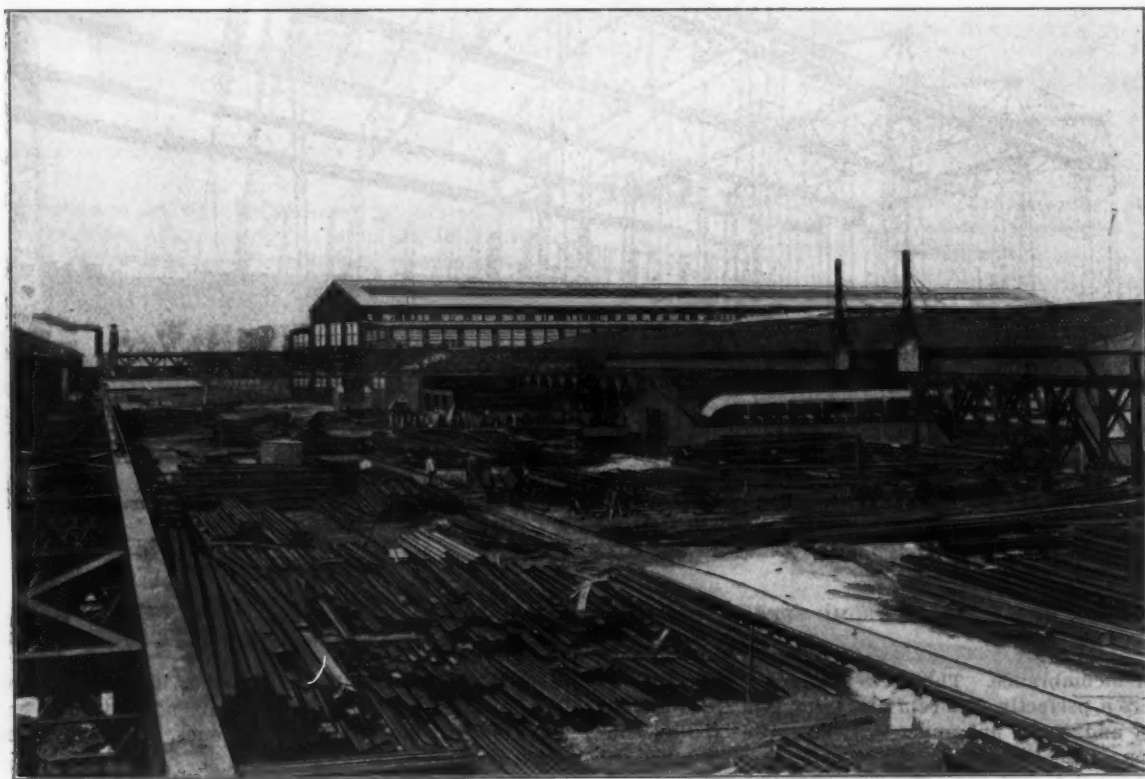


Fig. 3.—Ship Plate Yard.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

Rand type and a smaller one of the Ingersoll-Sargent type, which supply all the pneumatic tools. The large compressor has a capacity of 5000 cubic feet of air per minute and the other of 1000 feet. Air is distributed through the works at a pressure of 100 pounds.

Steam is supplied by six 6 x 16 foot return tubular boilers at 125 pounds pressure. The Sturtevant induced draft system is employed, the chimney being only high enough to carry the gases above the roof.

be carried by the various pairs of wires. By properly combining these voltages, pressures of 45, 90, 100, 135, 190 and 220 volts can be secured. A range of speeds can be obtained in which the highest is six and one-half times the lowest.

As an illustration of the advantage accruing with electrical power distribution, it may be stated that the total horse-power consumed when all the motors and machines are running is 2000, but the average daily

enou  
is no  
set o  
wires  
are n  
wires

load is only about 400 horse-power. This, of course, varies between considerable limits, as when the larger tools and cranes are in operation.

The average center of distribution in each building is about 500 feet from the generator house. The wires are placed in about 1000 feet of masonry subways, large

tubing to the motor. This insures the circuit against accidental injury and the workmen from shock.

#### The Ship House.

The ship house shown in the first engraving is an open steel structure, having a span of 185 feet between

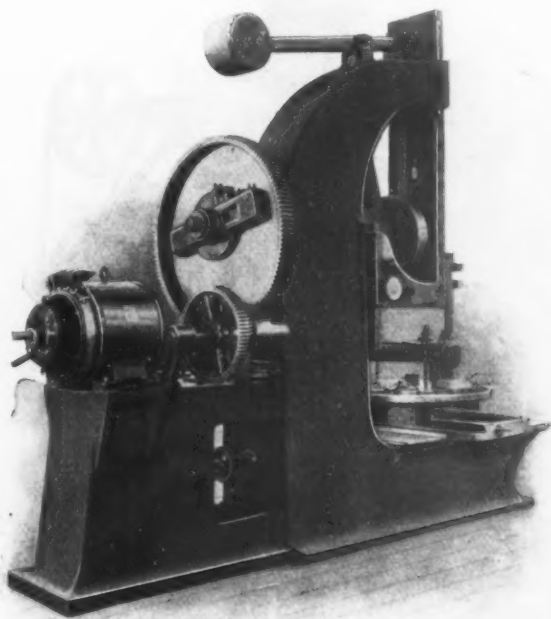


Fig. 4.—Electrically Driven Niles Slotter.

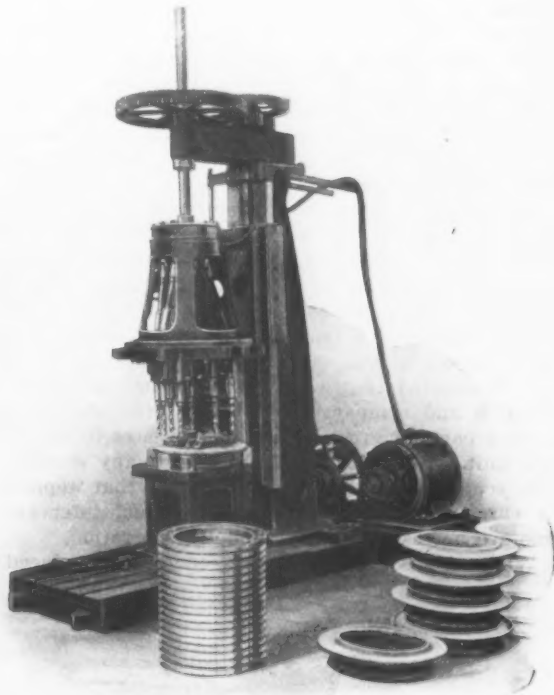


Fig. 5.—Electrically Driven Baush Multiple Drill.

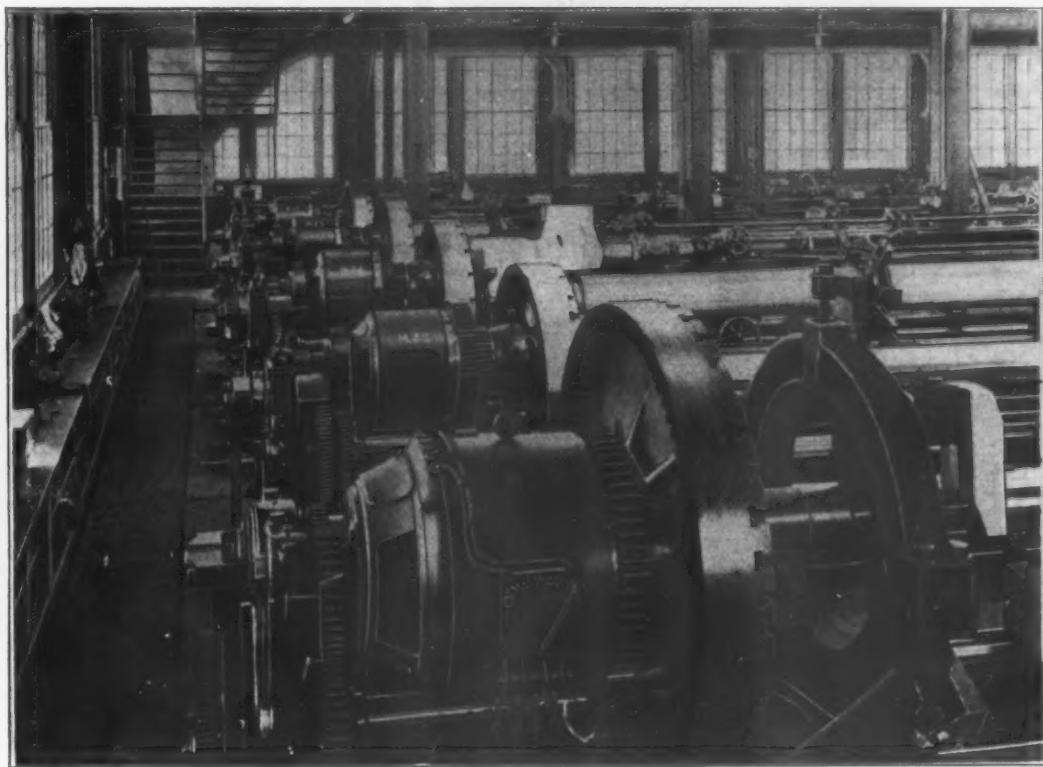


Fig. 6.—Fitchburg and Bement & Miles Lathes.—Motor on Head Stock.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

enough for a man to pass through, and in addition there is nearly a mile of pole line. Each ship has its own set of mains leading to a distributing board, from which wires are extended to the several machines. There are no exposed wires whatever near the tools. All the wires are under the floor and are brought up in steel

columns and 490 feet in length. This house differs most essentially from anything of the kind, either in this country or abroad, and since its completion the many practical advantages possessed by the design have been thoroughly demonstrated. Rapid work and economy are synonymous terms in shipbuilding, and the ef-



iciency of a fixed overhead structure, upon which a number of cranes can be rapidly and independently moved the entire length of the ships, have been clearly proved by the actual progress on the 15,000-ton battle ships "New Jersey" and "Rhode Island," which are here building. The increase in capacity made possible by this design becomes particularly marked when comparison is made with the simple cantilever extending over two ships and traveling upon a tower placed between them. With an equipment of this latter type, not only is the service practically limited to a single crane for the two ships, but the weight of crane in proportion to the average load carried is excessive, as is also the power required to move this great crane weight along the track.

Extending lengthwise of the house are four crane tracks carried by the lower chords of the roof trusses. These are at an elevation of 100 feet above the ground and each carries an electric traveling crane of 5 tons capacity, which, by means of a yoke or equalizing bar, can be arranged to work in pairs for heavier loads. The efficiency of this method will be appreciated when it is recollected that a ship is composed of thousands of small and comparatively light parts and less than a dozen parts of great weight, which have to be moved as a unit. And since a ship may be many months, or even years, in building, it is apparent that appliances for carrying great weights only at long intervals of time are not essential to economical operation.

While this service has but recently been placed in

keels upon the wooden blocking. The starboard crane worked nine and the port crane seven hours, practically an average of eight hours' work. The weather conditions were not favorable and early in the afternoon a steady rain set in, the men, however, continuing at



Fig. 7.—Sellers Tool Grinder.—Motor on Floor.

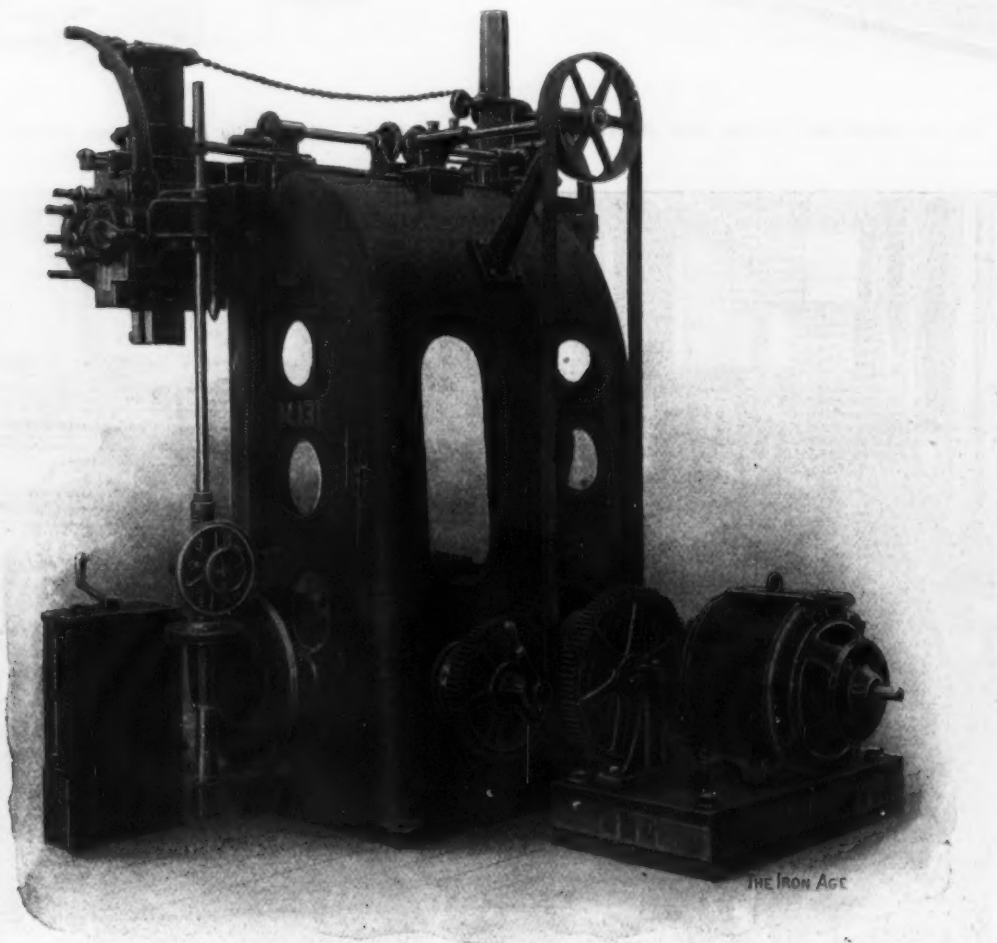


Fig. 8.—Niles Boring Mill.—Motor on Floor.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

commission and has not been operated to its full capacity, the following record will indicate what may be expected in the near future when men and equipment shall have settled down to the work before them. On the morning of May 17 last the only indication of the future battle ship "Rhode Island" consisted of the flat

work. The record showed 71 frames set and bolted on the starboard side, 47 frames on the port side, 98 floor plates and 1 vertical keel plate, a total of 217 separate pieces. The men employed on the job comprised 12 "fitters" and "bolters up" and 8 ship carpenters and riggers, a total of 20 men. The cranes were operated in



advance of each other—that is, while one crane picked up a frame at the end of the ship house and took it to its place in the ship to be set and bolted up by the men, the other crane returned from its trip to the ship and was made fast to its next load. It will be noted that comparatively few men were detailed to the job, and

#### Some Electrically Driven Tools.

About 75 per cent. of the motors are direct coupled to the tools. The others are belted, and in one or two cases are counterbelted, to attain high speed, the latter being confined mainly to the wood working machines. A study of the accompanying engravings will show how

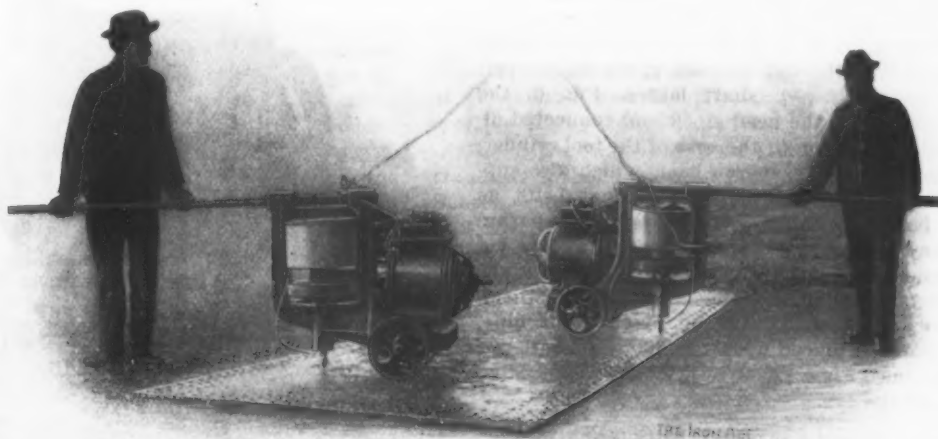


Fig. 9.—Electrically Driven Countersinking Machines.

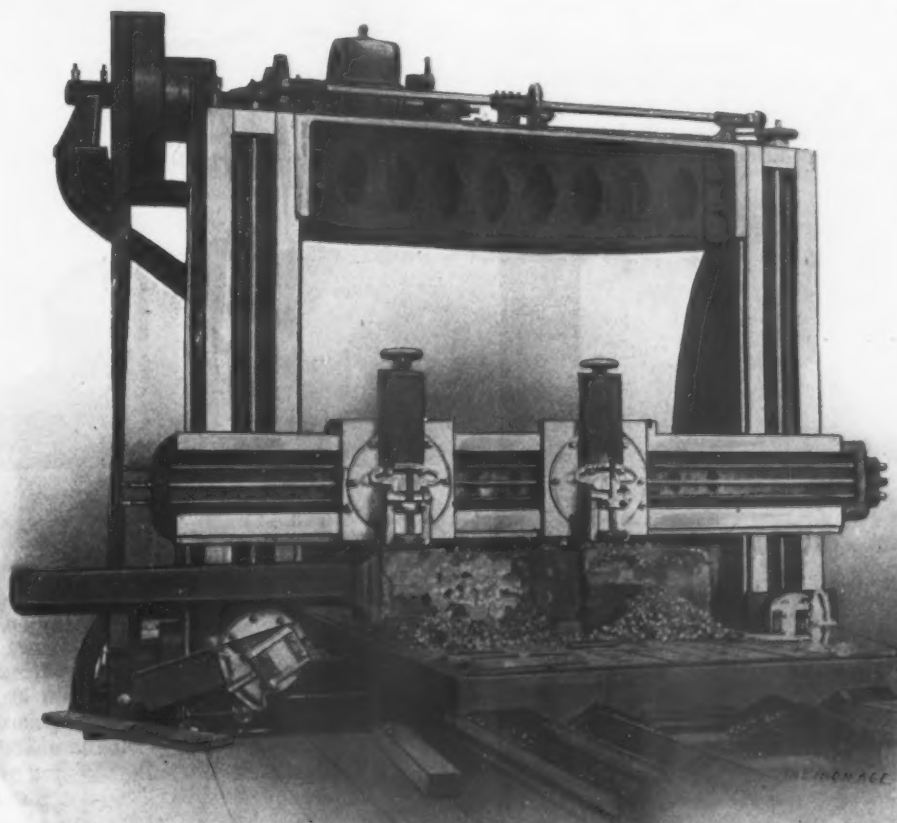


Fig. 10.—Niles Planer Driven by Motor Placed on Top.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

at no time was the full capacity of the crane service even approached.

The ship plate yard, Fig. 3, is controlled by a crane having a clear span of 150 feet and a travel of over 700 feet. This yard is entered by a standard gauge track and is located between the pattern and ship tool shops. In it are stored the plates, angles and other shapes which are required in the ships.

the motors have been adapted to the tools and not the tools redesigned or altered to accommodate the motor. Wherever possible the motor has been placed directly upon the tool in the position best suited to connect with the original drive. In other tools it has been necessary to provide an extension in the form of a bracket and then connect the armature shaft with the drive. Still another plan has been to provide the motor with a

separate foundation independent of the machine. Illustrations are presented of all these methods, and the several plans are so clearly brought out in the half-tones as to require but little in the way of explanation.

The slotter, Fig. 4, is furnished with a rear bracket. Between the armature shaft and the main gear of the machine are interposed two pinions and two gears of different sizes, working in pairs. The multiple drill, Fig. 5, has its motor on a separate base, a pinion on the armature engaging with an intermediate gear which transmits the power through beveled gears to the vertical shaft. In the heavy shaft lathes, Fig. 6, the motors are mounted on the head stock and connected direct with the lathe drive. In the case of the tool grinder, Fig. 7, the motor is on a cast iron base, which also supports the grinder itself. The drive is through belts, as shown. The boring mill motor, Fig. 8, is on a separate foundation and operates through gearing, as shown. In the machines illustrated in Figs. 10, 11 and 13 the motor is placed on top, all of the machines lending themselves to this arrangement. In the joggling machine, Fig. 12, the motor is placed upon the floor. In both the punching machines, Figs. 11 and 13, the motor is located in the frame at the top.

#### Electrically Driven Countersinking Machines.

An interesting machine, and one which has proved its efficiency ever since it was introduced, is shown in Fig. 9. It is intended for countersinking the rivet holes in ship plates. The machine consists of a horizontally disposed motor geared to a vertical drill stock carrying the countersinking tool. Just above the drill is a reservoir from which water is led to the drill point. The device is mounted upon a truck and is provided with a handle, by means of which it may be shifted easily and which provides a lever for forcing the drill down. This method is much more expeditious than the old way.

cle to remove the central portion and then chipping and filing the edge of the opening. The operation is slow and expensive. In the new way the manhole is cut out at one setting of a special tool, and the opening is left with such a clean edge as to need no further work. The

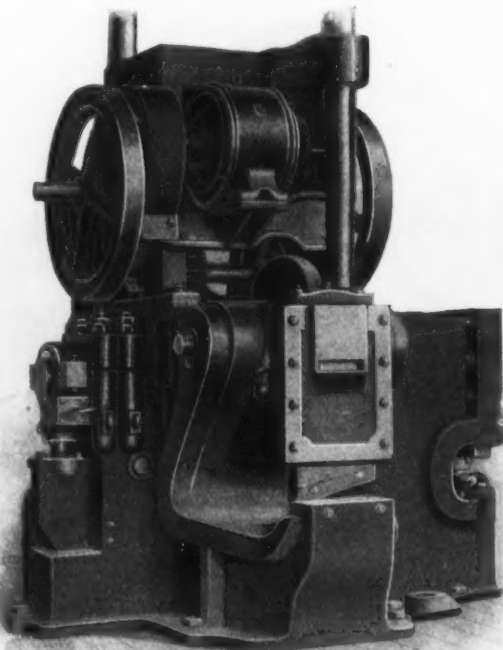


Fig. 11.—Four-Throat Punch and Shear.—Motor on Top.



Fig. 12.—Joggling Machine.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

since there is no moving of the plate, the tool being moved instead.

#### Cutting Out Port Holes.

Another practice peculiar to this yard is the method of cutting out port holes in the sides of a ship. Heretofore this has been done by boring holes around the cir-

machine consists of a three-legged spider or frame, the distance between the legs being a little greater than the hole to be made. From the center of the frame extends a screw bolt, which passes through a hole in the center of the port opening. A nut upon the other side of the plate serves to hold the frame rigidly against the

plate. Suitably mounted in the frame is an internal gear, which is driven by a compressed air motor, also carried by the frame. The gear drives an ordinary parting tool, which describes a circle the exact size of the opening to be cut. The tool is fed forward by a screw actuated by hand. The simplicity of the device is not its least noteworthy feature.

#### Driving Large Rivets.

The rivets through the keel of the seven-masted schooner "Thomas W. Lawson," which was launched a short time ago, were nearly 5 inches in length by  $1\frac{1}{4}$  inches in diameter. It was not possible to upset these properly with an ordinary yoke, one arm of which served as the anvil to resist the blows of the pneumatic hammer carried by the other arm. To have made the anvil heavy enough to accomplish the purpose would have produced a tool extremely awkward and difficult to handle in the cramped quarters underneath the keel. The difficulty was overcome by doing away entirely with the anvil and substituting a second pneumatic

#### Shenango Valley Iron Notes.

SHARON, PA., August 2, 1902.—The town of Wheatland, 4 miles south of Sharon, is having a remarkable industrial awakening. The large plant of the Continental Iron Company, under the management of Ephraim Truxall, is now being operated double turn, and the plant is undergoing important improvements. A three-high plate mill, large squeezer and four large heating furnaces have been installed. It is possible that the Sharon Brass Mfg. Company will erect their new brass foundry at Wheatland, and the Sharon Foundry Company are erecting an iron foundry there.

The Town Council of West Middlesex have granted a franchise to the East End Street Railway Company of Sharon, and it is likely that Sharon and West Middlesex will shortly be connected by an electric line. The line will, it is stated, have a New Castle connection before long, and if it does, the Shenango Valley, with its brisk iron towns, will have one of the most perfect systems of



Fig. 13.—Double Punching Machine.—Motor in Frame.

#### SOME SPECIAL TOOLS AT THE FORE RIVER SHIPYARD.

hammer. The two hammers, one on the end of each arm of the yoke, worked perfectly and there was no further trouble in making the rivets fill the holes completely. The strokes of the hammers were so exceedingly rapid that it made no difference whether they worked synchronously or not.

In the foregoing we have merely endeavored to describe some of the characteristics of this yard which are peculiar to itself, and without going into details of the entire equipment.

**To Manufacture Track Supplies.**—The scarcity of track supplies has induced the employment of capital in a new industry for the Canadian Soo, according to reports from Sault Ste. Marie. Work is being rushed on a building 40 x 60 feet, adjoining the present steel plant, in which splice bars will be manufactured. The machinery has been ordered and is expected to be ready for installation by the time the building is finished. About 60 men will be employed. A strong effort was made to buy splice bars for a new electric street railway in the open market, but it being found impossible to obtain the necessary supply within the time required it was determined to manufacture the splice bars, and possibly other track supplies. The rails are said to be ready for laying, but must await the fastenings.

interurban electric railway to be found anywhere. The New Castle and Sharon line, by way of Hubbard, is to be opened about August 1.

The Greenville Water Company have been purchased by Pittsburgh capitalists for about \$60,000, and they will spend \$20,000 upon extensions.

The borough of West Middlesex will at once begin the construction of their new water works, to cost between \$15,000 and \$20,000. The building of a street railway into West Middlesex, improvements on the blast furnaces, and the construction of the water works promises a brisk fall and winter in the town.

At a recent meeting of the Union Drawn Steel Company of Beaver Falls, Pa., Charles Davidson, president of the company, sold 744 shares of stock in the concern to F. N. Beegle and Mrs. J. J. Davidson. The shares transferred, it is said, are about three-fourths of the entire stock of the company, and were sold at \$402.23 per share, the total purchase amounting to about \$300,000.

The rate on iron ore from all lower lake ports to Scottsdale and Johnstown, Pa., has been reduced from \$1.40 to \$1.30 a ton.



## Lake Iron Ore Matters.

DULUTH, MINN., August 2, 1902.—With half the season gone, shipments of iron ore out of Minnesota have been 7,222,263 gross tons. This looks like 12,500,000 to 13,000,000 tons for the season. The shipments for the month of July, for the past four years, from Minnesota are as follows:

Road.	1902.	1901.	1900.	1899.
Duluth, Missabe & Northern .....	902,064	659,352	684,171	545,842
Duluth & Iron Range..	886,909	964,486	648,783	606,689
Great Northern Railway	595,000	430,000	277,518	192,672
Totals for July.....	2,383,973	2,053,838	1,610,472	1,345,203
Season to August 1..	7,222,263	4,678,735	4,831,966	3,406,172

Totals from other ports are not yet available, but will be next week. They will, however, show that the increase from Minnesota is nearly equaled elsewhere, and they will foreshadow nearly if not quite 25,000,000 tons for the season.

The taxable values of iron ore mines of Minnesota has just been fixed by the boards of equalization of St. Louis and Itasca counties. The former has fixed values of all mines at a trifle more than \$30,000,000, and has apportioned the valuations on a schedule arranged by the mining interests. Itasca County has yet very few mines, but the new Hawkins mine, for the lease of which \$525,000 was recently paid, is put in at \$20,000, the Diamond of the Oliver Company at \$14,000, and the Holman, now under option to the Donora Mining Company at \$300,000, was put in at \$15,000. These were the total ore valuations of that county. There is no mine assessment in counties adjoining St. Louis to the east, so these two are all in the State.

Several important changes have been made in the management of mines of the United States Steel Corporation. W. J. Olcott, who has been manager for the Mesaba range, is now general manager of mines on all ranges, a position heretofore held by President T. F. Cole. Mr. Cole will now have more time to devote to other important duties. His constant, exact and detail attention to the mines was very arduous and confining, and was enough, when added to other work, to break almost any man's health. Mr. Olcott is skillful, competent and courteous and his advance is merited and pleasing all round. He has been in active charge of the operation of the Duluth, Missabe & Northern Road. This is now in charge of W. A. McGonagle, late with the Duluth & Iron Range, where he made a splendid and long maintained record for the best kind of efficient work. His title is assistant to the president and his duties are the management of the road. L. W. Powell, who has been agent for the Oliver Iron Mining Company, becomes assistant to President T. F. Cole, and will have his field of operations broadened to fit his high abilities.

The Wisconsin & Michigan road, running to Marinette, is to enter the ore carrying field on the Menominee range in a new way. It will build a fleet of car ferries to operate between Green Bay and South Chicago, and will connect its road with mines at the various centers of the Menominee range. It will have a rail haul of about 60 miles from Iron Mountain to Green Bay and a car ferry haul of the loaded ore cars of about 350 miles from Green Bay to South Chicago. At that point ore will be handled by rail to desired points. Car ferries are no new thing, but their use for anything more than a short or cross lake connection with a longer rail haul is decidedly new. If successful in practice it will cause somewhat of a reorganization of great lake traffic routes.

The Cambria Steel Company, who are owners of the mines of the Penn Iron Mining Company of the Menominee range and of 50 per cent. of the stock of the Mahoning Ore & Steel Company on the Mesaba, have made a proposition to the Republic Iron Company, Marquette range, to buy as much stock as may be offered at \$15 a share, or at the rate of \$1,500,000 for the mine. The proposition will be accepted by a majority of the stock. Republic grades are the highest mined in the Lake Superior region, but the output has been small of late years. The mine has been open since 1860, and about 5,000,000 tons have been produced.

### Menominee Range.

On the Menominee range the Oliver Iron Mining Company will at once sink a steel shaft at the Chapin mine. It will be located in limestone, will be 10 x 23 feet inside timbers, and will have four compartments, two skipways, a cageway and a pump compartment. The shipways will be 5 x 8 feet, an indication of the sort of work the shaft is expected to perform. It will be equipped in accordance with its size and importance, and will probably be the model shaft of the lake district. At 965 feet connection will be made with the Hamilton shaft. The large Cornish pump of the Chapin that once stood in D shaft will be installed in this shaft. Its normal capacity is more than 3000 gallons a minute, against a head of 1500 feet. The shaft will be similar in many respects to that now being completed at the company's Pioneer mine, with steel frames, plank lined, but with the planking broken by steel plate at intervals to prevent fire from reaching through from one length of timber lining to another. The Chapin mine is a magnificent property, larger now than at any time in the past, and comparable to the largest mines of the Mesaba range in value. It is worth the best that can be planned.

At the Aragon the same company has completed their No. 5 shaft, sunk 1080 feet to become the main shaft of this large mine. It was commenced 16 months ago, and work has been extremely rapid. It is in slate the entire depth, is 10 x 14 feet, and has four compartments. The timber compartment is so arranged that timbers can be lowered in the car on which they are run to the collar of the shaft. A crank and fly wheel pump of 2000 gallons capacity will be installed. A cross cut of 1200 feet will be run to the present workings of the mine, and in this will be laid a double track railway for pneumatic locomotives, which will do the tramping.

A large Eastern concern have taken an option on the Austin F. property at Iron Mountain and will sink a shaft there at once.

The Thomas Furnace Company of Milwaukee have secured the Smith property adjoining the Bird mine and will thoroughly test it. Ore of low grade, but considerable in quantity, is found in the Shaw exploration at Iron Mountain. The Newport Mining Company (F. Schlesinger) have bought the McCusker exploration in Iron County, paying \$7500 therefor. This was a property the Minnesota Iron Company dropped a year or more ago.

The Oliver Iron Mining Company are said to have taken some properties in the Felsh Mountain district and to be about to explore there. G. A. St. Clair of Duluth is the only worker there at present, but he has an encouraging showing for a good mine or two.

At the Great Western a large pump has been added to the bailers at work unwatering and the mine will be ready to hoist ore in a month. The Oliver Iron Mining Company have taken over the McGillis property and have commenced work there.

With all the work done on the Menominee the past four or five years it is remarkable that so few really large new properties have been found. The good mines discovered can be counted on the fingers of one hand. Consequently exploration lagged, but there is now a revival of interest and more work is scheduled for the immediate future than in some time. While new mines have been scarce old ones have shown up well, and several of them have been enlarged enormously.

### Marquette Range.

At the Negaunee mine on the Marquette range the Oliver Iron Mining Company have added to their force lately and are mining nearly 1000 tons a day. The mine is in better condition than before the cave of January, and will be operated heavily for the coming year, prior to its operation by the Cleveland Cliffs Company. The same company's new Hartford mine, which is a deep property, is being put in shape for work, and will be a considerable factor in next year's output. This company may shortly commence operation on the Cascade lands recently bought, where lean siliceous ores are to be mined in abundance. There is a vast tonnage in these holdings, and they will some time form an important asset.

On the old Minnewawa mine, near Hurley, Gogebic range, it is reported that a find of ore has been made.

At this and at the Germania, adjoining, careful explorations will be made immediately. These properties have been idle many years, and were never considered of great present importance, though they always were regarded as good prospects.

On the Mesaba range the Cleveland Cliffs Company have taken for \$48,000 bonus, to be paid when the lease is demanded, 160 acres of land adjoining the Hawkins mine in 32-57-22. They also pay a 25-cent royalty. Several million tons of lean ore have been found there. Lean ore has also been found on the east side of the Hawkins, but it may be of little or no value. The Arcturus, which was abandoned by option holders Kimberley, *et al.*, is now under negotiation with other parties. The Jordan, a new mine near Hibbing, has commenced shipment. It is an underground property worked on the milling system. All the lands of the Mesaba Central Land & Exploration Company, including 5,000,000 tons of ore leased to the Republic Iron & Steel Company at 18 cents a ton, and 37 undeveloped 40-acre tracts in 58-18 and 58-19, have been sold to Pittsburgh people for \$250,000. This is an investment deal, with the chance of finding ore in the undeveloped lands additional.

The Dear-Lerch iron ore properties in Southwestern Utah, which were fully described in *The Iron Age* by me two years ago this spring, have now been sold to Messrs. Kimberley, Buhl and others for \$2,250,000. The deal for a bond was closed a few days ago at Salt Lake City. These ore mines are surface deposits of soft ore, in quantity, lying in Iron County, Utah, and are much like the Mesaba ore in both chemical and physical character. Some ridiculous and very much exaggerated statements are now being made about these finds, credited to men who should, and probably do, know better than to make them. But the facts are that the deposits are of immense extent and value.

D. E. W.

### Gas Engine Research in Germany.

The Institution of Civil Engineers publishes the following abstract of a report by Eugene Meyer issued in the *Zeitschrift des Vereines deutscher Ingenieure*:

This is the first installment of the results of experiments on gas engines carried out at the Institution for Technical Physics at the George Augustus University in Göttingen. The engine employed for the research work is a 10 horse-power Deutz motor. Both lighting and power gas are to be used. A description is given of the engine, power gas plant and the apparatus to be used for measuring the gas, cooling water, &c., and the degree of accuracy to be expected with the measurements.

The first questions investigated were concerning the effects of varying amounts of piston lubrication and the temperatures of the cylinder walls. The lubrication was begun with one drop every 40 seconds, for which the mechanical efficiency was 0.706, and the amount of gas used per brake horse-power per hour 823 liters (29 cubic feet), and per indicated horse-power per hour 582 liters (20½ cubic feet). The lubrication was gradually increased until the oil was running in almost a continuous stream. The mechanical efficiency had risen to 0.79, the gas used per brake horse-power per hour had fallen to 648 liters (23.2 cubic feet), and per indicated horse-power per hour to 512 liters (18.3 cubic feet). The load on the engine was practically the same throughout.

The great decrease in the amount of gas used as the supply of lubricant was increased is accounted for by Meyer on the supposition that some of the oil was vaporized in the cylinder and burned along with the gas. More elaborate experiments were made with the same result. In further experiments the temperature of the cylinder walls was varied from 16 degrees C. to 70 degrees C., while the oil supply was very liberal. In both cases the heat value of the gas supplied was 2412 W. E. (9648 B. T. U.) per indicated horse-power per hour. From this it seems possible that even at comparatively low temperatures lubricating oil may be burned and contribute to the work done on the piston. The accuracy obtainable with the ordinary indicators was specially investigated, and also the methods of calibrat-

ing the springs. The temperature of an indicator may of course vary, and it was found in one case that the scale of the spring was altered by 4 per cent. when the temperature was changed from ordinary room temperature to about 90 degrees C. The dynamical theory of the indicator is applied to a few actual cases, and a graphic method is given by which the use of a Fourier series to represent the relation between pressure and time is avoided. The inertia of the parts is found to have little effect. Friction and inaccuracy of fitting in the indicator motion are the most important factors in distorting diagrams from their true shape. The indicated power of a gas engine cannot be determined with perfect exactness, and, while in many cases an accuracy of 1 per cent. may be obtained, in others the errors may be as much as 2 or 3 per cent.

### The John Fritz Gold Medal.

Some months ago a group of gentlemen got together for the purpose of organizing a suitable celebration of the eightieth birthday of John Fritz. Under discussion the plan grew until it was decided to establish a John Fritz Medal, to be awarded every year "to the originators of the most useful scientific or industrial achievements, in perpetual honor of John Fritz and to the glory of engineering."

In order that the subscribers to the fund should be numerous it was decided to permit each one to contribute \$10, no more and no less. Enough has now been subscribed to insure the success of the project, but a little more money would be desirable. It is not proposed to ask any individual for a large subscription; therefore there is still an opportunity for those who wish to be enrolled on the honorable list of subscribers.

The purpose is that this medal shall be awarded by a perpetual committee of 16, to be appointed or chosen in equal numbers from the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. Rules for the award of this medal have been prepared. The field is the world. The committee may select any person of any nationality. No award shall be made until after at least one year of consideration, and it must have the affirmative vote of at least three-fourths of the board. The hope and belief is that this medal will be a distinction not second to the Bessemer Gold Medal, awarded by the Iron and Steel Institute.

The public celebration of Mr. Fritz's eightieth birthday and of the foundation of this memorial will be held in New York City, October 31. This celebration will take the form of a dinner, in which the subscribers to the fund will have the first opportunity to participate, but it is believed that there will be room for a few guests. A circular giving particulars of the dinner will be issued in a few weeks. Meanwhile we would suggest that any of our readers who are interested in this matter, and who may wish to be enrolled among the subscribers to the medal fund, write for particulars to John Thomson, treasurer, 253 Broadway, New York City.

The new crucible steel plant which has been under erection by the Jessop Steel Company, at Washington, Pa., for some months, is nearly completed and will probably be started up within 60 days. The annual capacity of the plant will be about 10,000 gross tons of fine crucible steel. No bars will be rolled, but the concern will continue to import Jessop bars from the works in England. William Jessop is president of the Jessop Steel Company; Sydney J. Robinson is vice-president and James Jessop is secretary and treasurer.

At Pittsburgh, the Crescent Steel Company have asked for a decree in dissolution as the result of action taken by a majority of the stockholders. This concern were absorbed about two years ago by the Crucible Steel Company of America, and will legally go out of existence.



### The Metric System Abroad.

WASHINGTON, D. C., August 5, 1902.—Prof. S. W. Stratton, director of the new National Bureau of Standards, has sailed for Europe for the purpose of studying the scientific equipment of similar institutions abroad. Incidentally he will investigate the present status of the metric system in Europe, and especially the situation in Great Britain and in Russia, the only countries of importance except the United States which have not adopted the system. Professor Stratton's trip will enable him to lay before the committee of Congress early in December the latest definite information not only with regard to the progress made toward the adoption of the metric system in England and Russia, but also concerning the experience of those foreign countries which have recently abolished their old systems for that based on the international meter. Before his departure Professor Stratton made an interesting statement in which he spoke very hopefully of the prospect for the early adoption of the metric system by Great Britain. He said in part:

"It is conceded by those in a position to judge that the adoption of the metric system by either Great Britain or the United States will cause the other to follow at once. On the basis of recent correspondence and collateral investigation I am confident that the interest which the people of Great Britain, and especially its manufacturers, are now taking in this movement is much underrated. Every one is familiar with the work of the special committee of the House of Commons appointed several years ago to investigate this question, but the impression in this country seems to be quite general that nothing has since been done in the way of interesting the general public in the matter. As a matter of fact much progress has been made. From data received we are advised that over 200 members of Parliament have pledged themselves to vote for the compulsory adoption of the system, and this proposition has been indorsed by the London Association for the Protection of Trade. The Edinburgh Merchants' Association, the Association of Trade Protection Societies, the Munster Merchants' Association, the Rochdale Merchants' and Tradesmen's Association and the Metropolitan Grocers' and Provision Dealers' Association have adopted resolutions favorable to the change, and similar organizations throughout Great Britain have taken similar action, while many others have the subject now under consideration.

"In the city of Liverpool alone the Iron and General Metal Trades Section of the Liverpool Chamber of Commerce, the Cotton Association, the Wool Brokers' Association, the Corn Trade Association, the General Brokers' Association, the Ship Owners' Association, the West India Association, the Warehouse Association, the Salt Chamber of Commerce, and the Provision Trade Association have all expressed themselves in favor of an act of Parliament legalizing the system at once and making it compulsory after a lapse of two years, with the understanding that in the meantime the metric system of weights and measures shall be taught in all the public schools. It is a very interesting and significant fact that in no single case has any body of traders in Great Britain opposed the compulsory adoption of the weights and measures, while the movement has been cordially approved by a recent congress of Associate Chambers of Commerce of the British Empire.

"In this connection it is most interesting and suggestive that the New British premier, the Rt. Hon. A. J. Balfour, while First Lord of the Treasury, recently made a succinct but comprehensive statement with regard to the adoption of the system which is most encouraging to its friends throughout the world. He then said in part:

"Upon the merits of the case I think there can be no doubt whatever that the judgment of the whole civilized world, not excluding countries which still adhere to the antiquated system under which we suffer, has long decided that the metric system is the only rational system. What men of science have long been obliged to do—not merely because the international character of science makes it desirable, but also be-

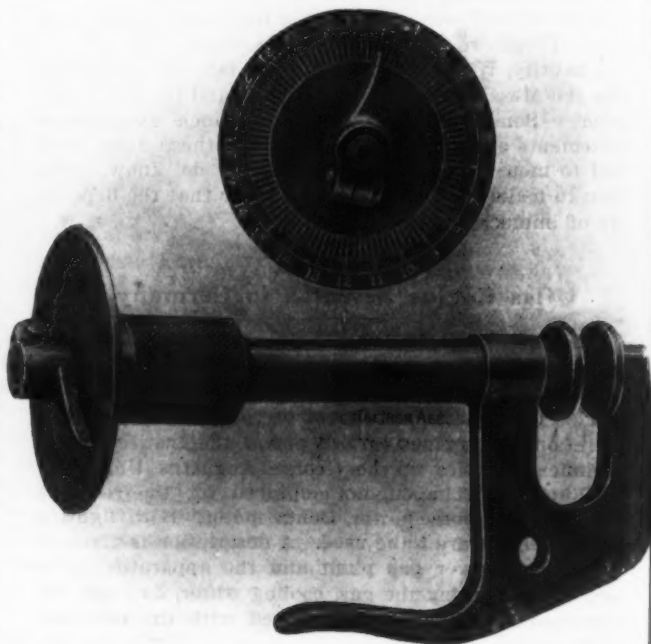
cause the calculations are much more rapid, so much more convenient—what men of science for these reasons are obliged to do, I believe the commercial firms in all parts of the country are beginning to think they must do also. On that point I do not think that argument is possible."

"In Russia preliminary arrangements are being made for the adoption of the metric system, and I am advised by Assistant Secretary Pierce of the State Department that the proposed law has been drawn up by the Minister of Finance, approved by the State Council, and is ready for the signature of the Emperor. The system is now compulsory in the medical departments of the army and navy, in the Government reports, in the custom service, and, of course, in all scientific investigations. It would therefore seem that Russia is about to be eliminated from the smallest of nations which have not yet adopted the metric system, and the only question remaining is whether the United States or Great Britain will bring up the rear in the march of progress."

W. L. C.

### The Slocomb Sheet Metal or Rubber Gauge.

The gauge designed by J. T. Slocomb & Co. of Providence, R. I., differs from other micrometers in several



THE SLOCOMB SHEET METAL OR RUBBER GAUGE.

important points. The thimble makes but one revolution in measuring the full extent of its range— $\frac{1}{4}$  inch—and there is but one scale of graduations, which are all on a dial in plain sight. The lead of the measuring screw is so great that there is not much chance of measuring differently on account of different degrees of pressure on soft material. The instrument is held and operated entirely by one hand, leaving the other free to hold the work. Neither of the measuring points revolves, which is an advantage when gauging soft or sticky material.

The construction is plainly shown in the drawings. Fig. 2. The thimble D has an internal thread  $\frac{1}{4}$  inch long. The enlarged end of the sleeve E has an external thread to fit the thimble, but  $\frac{1}{2}$  inch long, thereby allowing the range of travel to come on the external thread, which is accurately cut. The thimble has also a plain bore at F which fits loosely an enlarged part of the sleeve E, excluding all dirt from the screw threads. This screw thread is multiple cut 32 P., but  $\frac{1}{4}$ -inch lead. The plunger G has two bearings in the sleeve E, one in enlarged bore in the thimble end and one in the bushing near the measuring cap, and slides freely through these bearings, but is prevented from turning by a small key working in a keyway in the sleeve E. The pointer H is clamped to the end of the plunger and does not revolve, but the dial revolves under it. The dial is at-



tached rigidly to the thimble. Surrounding the plunger and inside of the sleeve there is a spring, J. This spring is under compression and torsion and takes up backlash in the screw threads, also on the thrust of the plunger inside of the thimble, and by its torsion keeps the key bearing on one side of its keyway and thereby preventing the pointer from shifting its position on account of some looseness in the key fit. The gauge is held with the handle K resting in the palm of the hand, with the thumb and forefinger on the thimble and the other fingers on the sleeve E, in which position the thimble is quickly and easily operated by thumb and forefinger. The adjustment for wear, except what is taken care of by the spring, is made by shifting the pointer.

These gauges are made with small points adapted for measuring metal, and also with differently graduated dials, some in thousandths of an inch and others to correspond with the different wire gauges.

### The Russian Iron Industry in 1901.

The *Iron and Coal Trades Review* notes that Russia is one of the few countries whose career, from an iron

in the South, where Bessemer steel is relatively a much more important product than it is in other regions. Since 1896 the output of pig iron in Russia has increased from 1,612,021 tons to 2,895,623 tons in 1900 and to 2,831,680 tons in 1901, the last named year having been the first for a long period that showed a decline. The imports of pig iron into Russia in 1901 only amounted to 30,221 tons.

### Continuance of the German Crisis.

Simon W. Hanauer, United States Deputy Consul General at Frankfort, Germany, sends the following interesting information relative to German industrial conditions:

The annual report lately issued by the "Seniors of the Merchants of Berlin" (Chamber of Commerce), in speaking of the crisis, quotes from the published business statements for 1901 of leading German industrial companies. Among them is a statement by the great locomotive works of A. Borsig, from which the following is taken: The signs of economic decadence which showed themselves at the beginning of 1901 increased in course of time and the formerly existing lively demand was suddenly followed by a lack of orders. It became more and more difficult to find employment for the hands. To avoid the discharge of large forces of operatives it became necessary to obtain contracts regardless of regular prices. The reduction in the cost of raw materials which has since taken place is no equivalent for the reduced prices of the finished product, especially as coal and coke had maintained their price and the wages of the workmen were not much reduced. Consequently the burden fell on the manufacturer to tide over this eve of calamity. The locomotive manufacturing branch was not affected quite so unfavorably as the other branches of the metal working industry. Though at sacrifice, the Borsig works succeeded in keeping fairly well employed, having obtained orders from the Prussian State Railroad and from foreign countries. In spite of all willingness to make sacrifices, it was, however, impossible to obtain orders to keep other departments for machinery and boilers any way near in employment. Even the greatest efforts of our representatives and travelers abroad have not succeeded in filling this vacuum.

The Borsig report closes with the declaration that there are as yet no signs of an improvement in the situation. The directors of the Cyclops works in Berlin also deem the prospects for 1902 "not good," and they believe it will—owing to strong competition—be yet more difficult to obtain orders in 1902 than was the case last year.

**Canonsburg Steel & Iron Works.**—The Canonsburg Steel & Iron Works, Canonsburg, Pa., have bought the property owned by the American Tin Plate Company at Canonsburg and they propose to make additions and improvements to it which will necessitate a considerable outlay of money at once, but the works will be put in operation on or about the first of the year. The products will be fine steel and iron sheets for stamping and enameling purposes. The mill will be enlarged somewhat and the stamping works will be also equipped with new and modern machinery. The company have incorporated under the laws of Pennsylvania, with a capital stock of \$250,000. The officers are John F. Budke, president; John M. Watson, vice-president, and George Retberg, secretary. The report some time since that the plant had been dismantled is untrue.

Ross & Co., proprietors of the Pennsylvania Crucible Works, 1445 Marshall street, Philadelphia, announce that they have purchased the entire plant, including real estate, machinery, stock, book accounts and business of the Tacony Crucible Company, Tacony, Philadelphia. The business will be continued and in the near future will be consolidated with Ross & Co. under the name of the Ross-Tacony Crucible Company. Owing to the plant at Tacony being practically new they will in the course of the next three months move to the Tacony plant.

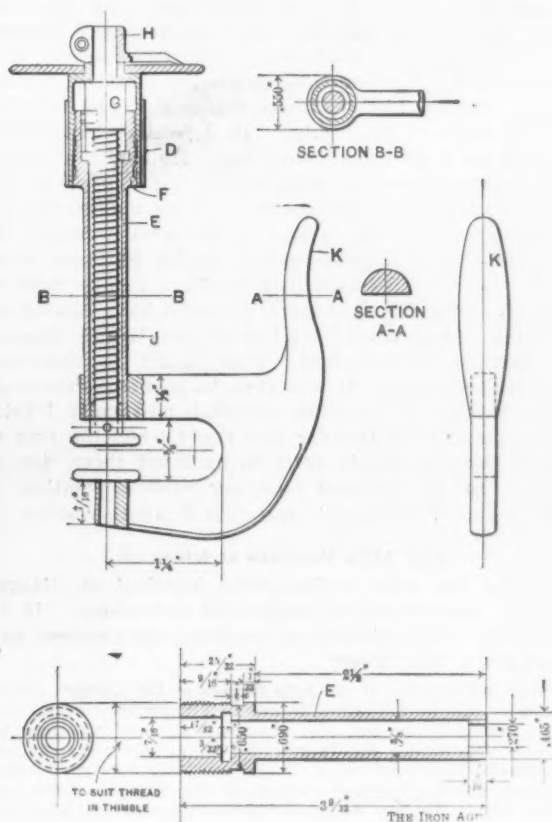


Fig. 2.—Details of the Slocumb Gauge.

trade point of view, supplies an illustration of the popular theory of the "dark horse." Like Germany, it has recently gone through a period of considerable tribulation, largely in consequence of the overbuilding of works and plants of all kinds, and in no direction has this been more apparent than in that of iron and steel making. Statistics officially issued within the last few days show that there are now 183 works in Russia producing pig iron, 92 works producing wrought iron and 67 works producing steel of all kinds. The total output of these works in 1901 was as under, in metrical tons:

Pig iron.....	2,831,680
Finished iron.....	327,915
Steel.....	Open hearth. Bessemer.
Blooms and billets.....	1,430,562 617,497
Finished steel.....	984,848 481,537
Castings.....	28,613 1,217

These figures show that the steel industry has now reached a considerable development in Russia, the output of finished material in 1901 having been 1,466,385 tons, while the output of blooms and billets was 2,048,059 tons. The largest output of all the districts was got

## Notes from Great Britain.

### Prices to Americans.

LONDON, July 26, 1902.—Subsequent information confirms what I wrote last week. Pig iron bought by Americans has almost invariably been at warrant prices. Ferromanganese has been sold at association prices, which are regarded as strictly private on this side for inscrutable reasons. Old steel rails for scrap have recently been sold at £3 10s., c.i.f., exclusive of duty, and steel angles at £6 10s., c.i.f., also exclusive of duty. This week 3500 tons of steel left Middlesborough by the "Hornby Castle" for Galveston. I heard yesterday of an inquiry for 100,000 tons of rails. The gentleman receiving it represents a German house. Being full up with orders he had reluctantly to pass it on. I imagine the American firm will esteem themselves lucky if they obtain half the quantity in anything like a reasonable time. No. 3, q.m.b., Cleveland pig, is quoted 51 shillings 3 pence to 51 shillings 6 pence, prompt f.o.b. delivery; mixed numbers East Coast hematite, 57 shillings, early delivery. Shipments of pig iron for the month of July will probably reach 80,000 tons; manufactured iron, 10,000 to 11,000 tons, and steel, 10,000 tons. Next week I hope to state the exact proportion going to America. To-day's prices are as follows: Pig iron, Scotch, 56 shillings 4½ pence; Cleveland, 51 shillings 3 pence; hematite, 59 shillings 10½ pence; spelter, G. O. B., £19; copper, £52 7s. 6d.; tin, fine foreign, cash, £126 10s.

The following are to-day's stocks: Connal's, Glasgow, 46,465 tons; Connal's, Middlesborough, 136,658 tons; hematite at Middlesborough, 300 tons; hematite on West Coast, 15,167 tons.

### The Home Market.

American purchases have materially helped to steady the home market. They came at an opportune moment, for the English market was distinctly unsteady. At the same time ironmasters are expecting a good autumn trade. Their anxiety was to get through the holiday season and the Americans have helped them in this in a most neighborly way. There is a fair amount of business doing, mills and forges being well employed, but at the moment no new orders are coming in. There is another fly in the amber: German steel is again coming into the market at prices English makers cannot or will not touch. For various reasons, however, German agents are not making much headway. The demand for best iron bars is not particularly brisk; the trade in unmarked bars is unequal and irregular. In some instances the association price has been obtained, but during the week half a crown less has been accepted. Iron sheets for galvanizing are distinctly weakening in price and difficulty has been met in obtaining specifications on account of contracts. The Wages Board for the Midlands meets next week, when some important points must be settled. The employees find that their wages average only 3 pence per ton more than those in the north, whereas, so they contend, by long established custom they are entitled to 6 pence. The men hint that unless their price is averaged up they will ask for a suspension of the sliding scale. The following Midland prices serve as a general index to prices:

Pig iron, Staffordshire cinder, 50 shillings; part mine, 53 to 55 shillings; all mine, 57 shillings 6 pence to 67 shillings 6 pence; best ditto, 77 shillings 6 pence to 80 shillings; cold blast, 95 to 100 shillings; Northamptonshire, 52 to 53 shillings; Derbyshire, 53 to 54 shillings; North Stafford, 54 to 55 shillings.

Finished iron, marked bars, £8 10s.; Dudley brand, £9 2s. 6d.; second grade, £7 10s.; unmarked bars, £6 12s. 6d.; angles, £7 10s.; sheets, singles, £7 12s. 6d.; doubles, £7 15s. to £8; trebles, £8 7s. 6d.

Steel, Bessemer billets, £5; best Siemens, £5 5s.; mild steel bars, £6 10s.; steel plates, £6 10s. to £7 10s.; steel girders, £6 to £6 5s.; steel angles, £5 15s. to £6 5s.

### Freight War to South Africa.

The announcement that R. P. Houston & Co. of Liverpool are going to run an independent fortnightly service of cargo boats to South Africa marks the beginning of a war upon the shipping rings. I have no desire

unduly to blame the "Conference" lines. They have naturally done what they thought was best for themselves, although I am inclined to think they have acted somewhat blindly. The "ring" consists of the Union-Castle, Clan, Bucknells, Bullard, King & Co., Rennie, Ellerman & Harrison lines—all British—together with the "Hansa" Deutsche line—German. This ring has had a practical monopoly of the South African freight trade, securing complete control by the system of 10 per cent. rebates, not paid until 15 months from date of acceptance of cargo, and only on condition that the shippers confined their consignments to "Conference" lines. But this is not the first time that an attempt has been made to break down the ring. Bucknells are now in the ring, but they originally started as an independent line and were finally forced "to come in." As the fight will be indiscriminately carried on both from New York and Liverpool, shippers should have some gay times. Indeed, New York has been the first to gain the benefit, the "Prince" line already having accepted rates at 10 shillings a ton, compared with 25 shillings a ton ex Liverpool. The most hopeful point in favor of R. P. Houston & Co. is that they are supported by the Chartered Company of South Africa and their affiliated companies. Other large shippers have also expressed their intention to give the new venture their support. But things are not necessarily what they seem. Two years ago I had a very long discussion with Sir Donald Currie, the head of the Union-Castle line and the very *fons et origo* of the "ring." In defending his position he told me a very significant fact. He said that one of the strongest levers he used in inducing shippers to sign the "Conference" agreements was an undertaking on his part not to ship cargoes on his own account. He was to confine himself strictly to his business as an ocean carrier. He said that hardly a month went by when, but for this agreement, he could have carried out valuable shipments of lumber or metals and disposed of them at a good profit. Then, again, he undertook punctual dispatch. It will thus be seen that there are two sides to the question, although personally I think a serious tactical blunder was made when the ring allowed German freight rates to undercut them, due, of course, to the German Government's subvention of "through inland rates." But that is another story.

### The Allis Engines at Glasgow.

When the Allis engines were installed at Glasgow English manufacturers prophesied evil things. If the following communication be accurate, the prophets have imagined a vain thing:

The performance of the Allis engines at the Glasgow electric tramway station has never ceased to greatly interest all engineers, owing to the fact that the installation of American machinery in a station at Glasgow, the center of a great engineering district, involved much discussion. The question of early delivery was a prominent element in the decision of the Glasgow Council, but the American makers were not satisfied with the kudos which came from the acknowledgment of the authorities that, but for the Allis engines, the electric tramways would not have been available at the opening of the exhibition. They have had exhaustive tests made by Professor Barr of Glasgow University, whose reports carry conviction because of his skill and experience in such work. I have had a reading of the report, which is highly creditable to the Allis engine. The consumption of steam per indicated horse-power, as measured by the condensed water, proved to be 12.12 pounds, and the mechanical efficiency of the engines was 96 per cent. The engines of 4000 indicated horse-power are coupled to 2500 kw. triphase electric generators and the ratio of the indicated horse-power to the electric horse-power proved to be 92 per cent. Mr. Parshall, the consulting engineer for the Glasgow Corporation, commenting upon the report, says that the engines are working perfectly well in all respects and have been from the beginning.

**The Pope Tin Plate Company.**—The capital stock of the Pope Tin Plate Company of Pittsburgh, with tin plate mill at Steubenville, Ohio, has been increased from \$500,000 to \$750,000. The plant of this concern is the largest independent tin plate plant in the country, containing 12 hot and 5 cold mills. Of these 7 hot mills are in operation, turning out black plate. The main building is 65 x 460 feet and the equipment of the plant is most modern throughout. It is expected the entire works will be completed and in full operation within 60 days.



### The Baldt Casting Process.

The casting process used by Frederick Baldt, Sr., of Chester, Pa., consists in the employment of a fusible pattern which is imbedded in suitable molding material. The mold is then heated, when the pattern melts and flows out, leaving the mold ready to receive the molten metal. The process will be understood from the sketch, Fig. 2. The reservoir A contains sand which flows out through the valve controlled opening B. The sand falls into the funnel shaped pipe D, from which it is forced by an air blast from the blower K into all parts of the mold H, so that the pattern J is completely covered. Before this takes place sufficient sand has

will probably elapse before a sufficient supply of raw material has been accumulated. It is expected that the furnace will blow in about December 1, running on a very choice grade of charcoal iron with low phosphorus. On the furnace property is an abundant supply of timber and iron ore. Some of the deposits of ore show only a trace of phosphorus, and if the latter mines are worked, the company hope to be able to make a lower phosphorus iron than has ever been produced in the United States. It is expected to make regularly a superior grade of charcoal iron for car wheels, malleable, steel castings, and for special foundry work. By washing, screening and crushing the ore before charging, it is expected to reduce the amount of fuel required to the minimum.

In the report of the committee appointed by the Lords Commissioners of the British Admiralty to consider certain questions respecting modern types of boilers for naval purposes they say: "In the course of their investigations the committee have watched the Babcock & Wilcox boilers fitted in the steamship 'Martello,' of the Wilson Line, employed in the Atlantic trade between Hull, Boston and New York. These inspections have taken place at the end of every round voyage for 14 months, and the committee's opinion is that these boilers have stood the test of usage in the mercantile marine extremely well. The vessel has run about 91,000 miles since the boilers were put in, and has usually been less than a week in port at either end; the only repairs required have been those of the ordinary upkeep of any boiler. It appears that water tube boilers are being very little used in large ships belonging to the mercantile marine, and that their use in such ships is increasing very slowly. In the British mercantile marine the only type of water tube boiler installed in ocean going vessels is the Babcock & Wilcox, in some ships of the Wilson and the Petersen-Tate lines, and in

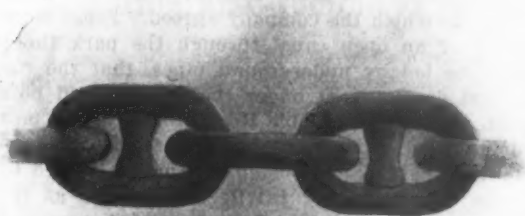


Fig. 1.—Chain Cast by the Baldt Process.

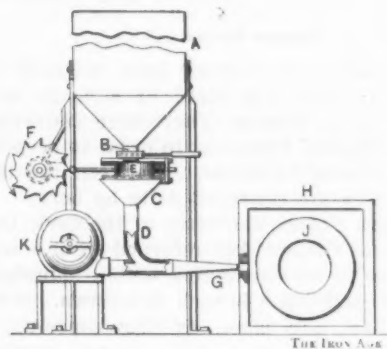


Fig. 2.—Sketch Showing Method of Molding.

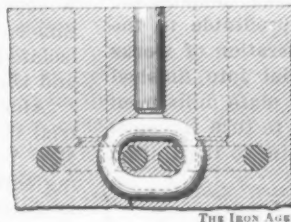


Fig. 3.—Molding Chain.

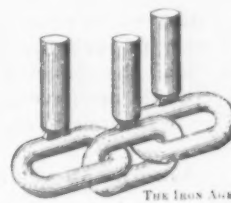


Fig. 4.—Chain As It Comes from the Mold.

### THE BALDT CASTING PROCESS.

been placed in the mold for the pattern to rest upon. At the bottom of the reservoir is a sieve, which is vibrated by the toothed wheel F. By this method it is possible to pack the pattern rapidly and effectively.

The method of molding a chain is shown in Fig. 3. In this each link is provided with a header, and both link and header are made of fusible material. The process has been successfully operated in the casting of steel articles, as is shown by the photo reproduction of part of a chain, Fig. 1.

**The Jefferson Iron Company.**—The Jefferson Iron Company, Jefferson, Texas, have been reorganized and the following directors elected: L. S. Colyar, R. W. Healy and George W. Lancaster of Chattanooga; D. W. Meacham of Cincinnati, W. B. Ward, F. J. Rogers and W. T. Atkins of Jefferson. Mr. L. S. Colyar has been selected president and treasurer, W. B. Ward, vice-president, and W. T. Atkins, secretary. Mr. Colyar, who will have charge of the Jefferson Company, is president of the Rome Furnace Company, Rome, Ga., and of the Eagle Iron Company, operating a furnace at Attalla, Ala. Mr. Colyar will continue his headquarters at Chattanooga, Tenn., but has already dispatched competent men to accumulate raw material for the Jefferson stack. The furnace is ready to be started at any time, but four months

three ships of the Allan line; in these last, however, only one water tube boiler is fitted in each vessel to assist the original cylindrical boilers. In the United States mercantile marine Babcock & Wilcox boilers are used to a small extent, principally in the ships plying on the Great Lakes, and in the American navy many Babcock & Wilcox boilers are in use."

The Navy Department will soon call for bids for a floating dock to accommodate a 16,000-ton battle ship, to be built in the United States and floated over to the Philippines. The amount available is \$1,250,000, and Admiral Endicott of the Bureau of Yards and Docks has about completed the specifications under which the huge structure will be built. Whether it will be towed across the Pacific or across the Atlantic, through the Suez Canal, will depend upon the place of its construction.

The Sharon Steel Hoop Company, Sharon, Pa., have executed a mortgage for \$250,000 in favor of the Dollar Savings Fund & Trust Company of Allegheny, Pa. The mortgage covers additions to the plant of this concern now under way, which include open hearth furnaces and bar mill.



## Canadian News.

### Progress at Sydney.

TORONTO, August 2, 1902.—James Ross, president of the Dominion Iron & Steel Company of the Dominion Coal Company, stated in an interview a few days ago that besides their output of pig iron for market the former company have turned out in July 10,000 tons of steel, at about half the cost at which steel was produced at the works in February. Every month, he said, the cost of producing steel was being lowered by the company. He does not say whether he expects to carry the reduction much further. In June the company had their ore delivered at Sydney at less than \$1 a ton, or from 35 to 40 per cent. below what it cost laid down last year. The output will keep on increasing, while the fixed charge will not be much greater, so that there is a possibility of still further economies. Not a single complaint, Mr. Ross says, has been made about the steel, but much satisfaction has been expressed with it. Three times the present output of the works could easily be sold, he considers. The home market will in time be increased by the establishment of other industries to consume steel. Mr. Ross expressed the opinion that if other corporations of good financial standing should be slow in coming forward to erect and operate such works the industries would be started by the Dominion Iron & Steel Company. The three buildings which are to constitute the rail mill are practically completed and the machinery is being brought upon the ground with all due dispatch. Several options have been acquired by the company for the purchase of ore properties, and a great deal of money is being spent in testing and developing ore bodies. As to the Coal Company, he said that the July output would probably amount to 300,000 tons. The earnings for March, April, May and June were \$300,000 more than for the same four months of 1901.

The state of the market across the line has been very favorable to the present stage of the Dominion Iron & Steel Company's business. The American demand for raw material has been and is more profitable to the company than would have been the operation of works of their own to turn the raw material into finished products. Had the company's rail and plate mills been finished it would not have paid so well to turn the steel billets over to them as to export the latter to the United States.

### Bounties on Newfoundland Iron.

The question of the incorporation of Newfoundland into the Canadian Confederation is again being discussed, and the disposition to throw in their lot with the Dominion appears to be growing stronger. The idea is now entertained by some of the public men of the ancient colony, and that is more than could be said a few years ago. If Newfoundland should become a province of Canada the effect upon the Dominion Iron & Steel Company would be beneficial. The ores of Belle Island would cease to be classed as foreign and their product in pig iron would at once become entitled to the full bounty paid for the iron made from domestic ore. At present they get 90 cents a ton less, the current bounty on the product of foreign and the product of domestic ore being \$1.80 and \$2.70 respectively. Ninety cents a ton would be a handsome gain for the company. The bringing in of Newfoundland would also doubtless put an end for good to the possibility of an export duty being imposed on the ore; but even if one should be imposed the Dominion Iron & Steel Company would not have to pay it, because the movement of the Newfoundland ore to their furnaces would no longer be an export business.

### Niagara Power Companies' Dispute.

The Ontario Government heard the representatives of the Canadian Niagara Power Company and the Ontario Power Company of Niagara Falls. The situation was very fully outlined at the beginning of the hearing by J. W. Langmuir, chairman of the Queen Victoria Niagara Falls Commission, with which body all agreements have to be made for power rights on the Canadian

side of the Falls. The last agreement with the Ontario Power Company, to which the Canadian Niagara Power Company objected, had been signed by the commissioners, but was not yet approved by the Government. Mr. Langmuir explained that by the agreement of April, 1899, the monopoly of the Canadian Company was done away with. Immediately the commissioners entered into an agreement with the Ontario Company, giving them the right to take water from the Welland River and lead it to the park where they had a right to develop power immediately under the bank surrounding the park, and then to lead it through the park to Table Rock House to a power house to be constructed in the gorge below the falls. In the early part of this year the Ontario Company desired to secure the privilege of taking water at Dufferin Islands, in addition to that from the Welland River, leading it across the park to join their canal from the Welland River. The commissioners were willing to grant this privilege on certain conditions, to which the company agreed. These were that instead of an open canal through the park the water should be led by underground pipes, that the right to the first development under the bank should be abandoned, and that the Table Rock House should be razed and that part of the park made more in harmony with a state of nature. The company further agreed to pay for the supplementary privilege the same as if they were granted new rights. It is for the Government, before ratifying this agreement, to decide whether it will lead to injury to the works of the Canadian Niagara Power Company.

After listening to the respective representatives of the two companies the Government promised to decide between them in a few days. This promise was made good on Friday, when it was announced that the last agreement with the Ontario Power Company would be so modified as to meet the wishes of both companies.

### Minor Notes.

Thirty-three machinists arrived from Scotland some few days ago to take the place of strikers at the Kingston Locomotive Works. They were conveyed to Simcoe Island, opposite Kingston, in order to keep them isolated from strikers' influence. Between the island and the works they are conveyed daily by boat.

Alderman John Coates, chairman of the Civic Industrial Committee of Ottawa, has returned from a trip to New York, where he was arranging with a manufacturing company to establish a branch in Ottawa. Wheels, springs, axles, &c., are made by this concern. The Alderman is assured, he says, that a branch employing 70 or 80 men will be started in the Dominion capital shortly.

Iron and steel men are likely to have the chief offices in the Canadian Manufacturers' Association. Cyrus A. Birge of Hamilton is mentioned for president. Mr. Munro of Montreal, who is now president, has stated his intention of not standing for election again. Geo. A. Drummond of Montreal will probably be elected first vice-president. He is head of the Canadian Iron Furnace Company, whose works are at Radnor Forges and Midland. The election of officers will take place at the Halifax convention on the 13th and 14th inst.

Ahearn & Soper have installed at Montreal and Chambly 20 Westinghouse electric transformers, said to be the largest in size and capacity of any in the world.

It is given out that the tube works of the Clergue corporation will be built this year. They will be situated ½ mile from the steel works at the Sault. Six hundred men, it is said, will be employed in them.

Parties are negotiating with the Mayor of Ottawa for the opening in that city of works to manufacture spades, shovels and garden tools. About 3 acres would be required for buildings, sidings, &c.

The steamer "Leafield" of the Algoma Central Steamship Company discharged at Parry Sound a cargo of steel rails from the Sault Ste. Marie works of the Clergue Company. From Parry Sound the rails are being carried by the Canadian Atlantic Railroad to the Intercolonial at Montreal.

It is not yet a certainty that the pipe works of the Montreal Pipe Company will be rebuilt at Acadia Mines

A proposition has been submitted to the civil authorities of Truro, N. S., for building them there. It is proposed to make them of a capacity to employ 100 men. Twenty-five acres of land freely granted, tax exemption and a bonus are asked.

Prof. W. G. Miller, Provincial Geologist, reports the opening at Massey Station of a promising copper property. It is expected that the output will be smelted at the works of the Ontario Smelting Company.

Prof. A. P. Coleman, who has been working in the north range of the Sudbury district, has written to the Director of the Ontario Mining Bureau that the Whistle property north of Blue Lake is probably the largest mass of ore in the region. He also inspected the iron range in Hutton Township. This interesting range is smaller than the Atikokan and magnetite in character.

C. A. C. J.

## Scientific and Technical Notes.

In a recent address on "Progress in American Bridge Construction" before the Section of Mechanical Science and Engineering of the American Association for Advancement of Science, Professor H. S. Jacoby states that "In 1893 only one railway in 75 specified a load on each driving wheel axle exceeding 40,000 pounds, while in 1901 only 13 out of 92 specified less than this load. . . The maximum load on each driving axle rose from 44,000 pounds in 1893 to \$60,000 in 1901." The maximum uniform weight required to be carried by bridges per lineal foot of track was 4200 pounds in 1893 and 6000 pounds in 1901.

Interest in the Edison storage battery is awakened anew by the practical tests which have been recently reported. A light runabout with 21 cells, weighing 332 pounds, made a run of 62 miles, climbing grades of 12 per cent., and at the end of the trip the battery was capable of driving the vehicle at 83 per cent. of normal speed. On a smooth and quite level road the carriage covered 85 miles on one battery charge. Five automobiles are being built to run 5000 miles each on a test. It is expected to cover 100 miles on a charge.

According to an account in the *Scientific American*, the air resistance to the rotation of a fly wheel may cause a considerable loss of energy. A 450 horse-power engine, direct connected to a generator, has a fly wheel with channel shaped arms. The tests were made by using the generator as a motor, driving the fly wheel up to normal speed. It required 13,300 watts to rotate the wheel and shaft, but by inclosing the arms in a sheet iron casing the wheel was driven by an expenditure of 9874 watts. The saving effected by use of the shield was 5.7 horse-power, or 1.2 per cent. of the power of the engine.

A trolley line is to be built at Franklin, N. H., without a track upon which to run the cars.

Experiments made in the physical laboratory of Cornell University showed the production of 116 grains of liquid air by 1 horse-power in one hour. Only 2 per cent. of the energy expended is stored in the liquid air.

Professor A. G. Bell is quoted as predicting that wireless telegraphy will never supplant wires in land service on account of the interference of the various stations. He considers the supremacy of the wireless method much more probable for transoceanic systems. Marconi reports having received messages on the Italian flagship "Carlo Alberto" which were sent from Cornwall across England and a portion of Denmark. The distances were from 850 to 1400 miles. It is reported that a submarine torpedo boat at Cherbourg, France, fitted with a mast and wireless telegraph receiver, received distinct signals from a central station. The distance is not stated.

The Missouri River Power Company have recently completed and put into operation an electric transmission plant which supplies energy to Butte, 65 miles distant from the power house. Six 750 kw. generators supply

this service. The current is generated at 550 volts, and is then transformed and transmitted at 50,000 volts. This power plant also transmits about 4000 horse-power to Helena (distance 20 miles) at 10,000 volts. The latter installation has been in service for three or four years.

A collapsing tap for rapid work in tapping threads with a turret lathe is described in the *American Machinist*. Four chasers are inserted in grooves in a conical plug in such a manner that longitudinal motion of these chasers relatively to the plug causes them to expand or contract. The action somewhat resembles that of the familiar drill chuck, except that the outer threaded faces of the chasers remain parallel to the axis. A stop rod passing through the center of the plug actuates the chasers, contracting them for withdrawal of the tap when the hole has been tapped to the required depth. Provision is made for automatically expanding the tap before it is brought up to the work by the forward movement of the turret. An adjusting screw in the stop rod provides for use in holes of different depths.

The *Engineer* (London) for July 11 gives a description of a universal machine tool capable of acting as a horizontal milling machine, a vertical milling machine, lathe (14 inches swing between centers, or 60 inches swing on a geared face plate) shaping machine, slotting machine, drilling machine, or profiling machine. The *Engineer* says: "It would be difficult, if not impossible, to remove from the mind of the average mechanical engineer a strong prejudice against a machine tool which will do everything. It is urged, however, that this tool may be used to advantage where space is greatly limited (as on board ship) or under other special conditions. One of the British war vessels has been provided with one of these machines.

It is claimed that an experimental balloon recently attained an altitude of 12 miles, recording a temperature of 80 degrees F. below zero, at Berlin.

## Alcohol Motors in Germany.

The alcohol or "spirit" motor industry has been developing very rapidly in Germany. The chief advantages of these motors as compared with steam engines are that they are always ready for work without a preliminary warming up; they can be filled up, oiled and started in from two to three minutes, there is no constant supplying of coal and water, no danger of fire or explosion, no consents required from Government authorities and no compulsory inspection. Their working is independent of the state of the weather, the "spirit" is easily obtainable in all districts, there is no smoke or smell, and the weight of portable "spirit" motors is about half the weight of portable steam engines of equal power. The "spirit" for motors, containing 90 per cent. of pure alcohol, can be purchased at from 20 pfennige to 22 pfennige per liter (about 3 cents per pint), delivered at any station in Germany. The motors exhibited at an agricultural fair at Halle last year were from 1 to 25 horse-power. As regards cost, the Dürr Motor Company were exhibiting portable spirit motors of 6 to 8 horse-power at \$1000, 10 to 12 horse-power motors at \$1300 and 16 to 20 horse-power at \$1625. Of the tests made one trial gave a consumption of 0.92 pound of 86 per cent. spirit and 0.81 pound of a mixture of one-fifth benzol and four-fifths 86 per cent. spirit, in both cases per B. H. P. per hour.

A. J. Yungbluth, Ishpeming, Mich., secretary of the Lake Superior Mining Institute, has issued a circular announcing that the eighth annual meeting of the institute will be held on the Minnesota ranges, beginning Tuesday, August 19, and will last three or four days. The matter of completing arrangements is now in the hands of local committees, who have planned excursions which will afford an excellent opportunity to visit all points of interest. Some very interesting papers will be presented at the different sessions.



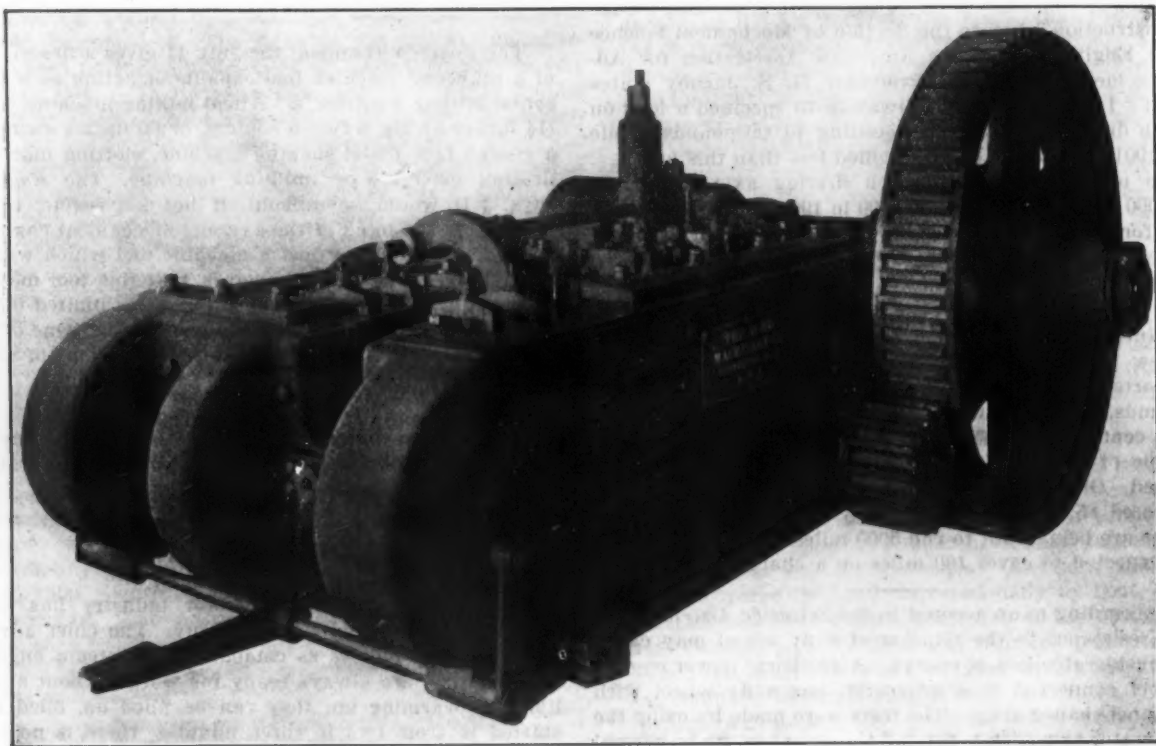
### The Acme Bolt Heading, Upsetting and Forging Machine.

The 4-inch upsetting and forging machine built by the Acme Machinery Company of Cleveland, Ohio, has been designed to meet the requirements of locomotive and car builders and other users of heavy forgings. The bed of the machine is a single steel casting weighing 18½ tons. The shaft is a fluid compressed steel forging. The grip slide, toggle head and moving die block are steel castings, while the toggle links are heavy tool steel forgings hardened. These links are four in number, so that the die block moves to its place in closing with a perfectly straight and even motion, no matter whether the dies are at either extremity of the die block or not. This is of great importance in forging close to size, because so wide a die block as is here used—about 2 feet—if moved with a single pair of clinks

### Central Pennsylvania News.

HARRISBURG, PA., August 5, 1902.—It is the belief here that the great coal strike will not last much longer. Every one is waiting for the end and already plans are being made for many things, the chief of which will be the rushing of work to run out orders and to start all plants going on full time. The scarcity of fuel is still severely felt, several plants not having made their accustomed output for weeks. Furnaces are hampered, for the anthracite strike has caused such an unprecedented demand for soft coal and coke that the producers are taxed.

Much interest is attached to the meetings of the State Capitol Commission, which will gather in this city several times within the next four or five weeks, and plans will be finally announced for the building of the new State capitol, for which the last legislature appro-



THE ACME BOLT HEADING, UPSETTING AND FORGING MACHINE.

would, when the dies were at one end of the block, be very apt to close them unevenly.

The mechanism that closes the dies is designed to give the very largest measure possible of what is known as "time"—that is, the time the dies remain closed with reference to the advance of the upsetting plunger. This means that the dies close so quickly that, after having been firmly closed, the plunger has as long a distance to travel as it is possible to get; and as the upsetting begins after the dies have been closed, it is desirable to have the plunger travel far and still have the piece being upset carry straight. The form of cam shown at c, Fig. 2, was selected, as it gives the largest measure of time.

The machine is capable of exerting a die pressure of 65 tons before the automatic relief becomes operative. This relief, which is of new and novel construction, will be understood from Fig. 2. The cam is mounted between the rollers P P, the connection with the ram B being made through the toggle lever L. The spring S is so mounted as to exert a pull upon an extension of one arm of the lever and tend to maintain it in the position indicated by the full lines. The relative proportion of the parts is such that a strain of 10,000 pounds on the spring is sufficient to resist a pressure through the dies of 65 tons. Any pressure in excess of this causes the spring to yield when the machine is instantly relieved. Throughout the machine the factor of safety is 15.

printed \$5,000,000. It will be entirely fire proof and there will be some large contracts let before the end of the year.

Industrially the situation here is fair. All of the works are running, the Lalance & Grosjean tin plate works having started after improvements, and other works being busy on steady orders. The Pennsylvania Steel Company added over 100 men to the already large force of men last week and some large shipments are being made for the East River bridge in New York.

At Reading the situation is not satisfactory because of the strike, but all look forward to its speedy end and are preparing for a boom in furnace and foundry work, several establishments having been positively crippled by the strike. The Warwick Furnace in the lower Schuylkill Valley was banked last week because of the strike and its attendant difficulties, and stocks are low at other stacks. Swedeland is still in operation. The National Brass & Iron Works at Reading have taken big orders for slot machines, patented by inventor Doremus, and will make 10,000 as a trial order, an order for several times that many being conditional on the original one.

The Berlin Construction Company have vacated the plant at Pottsville, and it is said that the buildings will be occupied at once by the new owners and that structural work for the plant of the Eastern Steel Company will be made therein.



The settlement of the strike of the York chain makers is very gratifying to people in that lively town and all of the industries are now at work. Heavy ordering of agricultural machinery is expected this fall and winter, according to a leading manufacturer.

The transfer of the old Mont Alto furnace property at Mont Alto, Franklin County, to the State of Pennsylvania removes another historic furnace. It was a well-known property for many years, as it was built in 1807 and ran until 1892. It made much iron used in important work in this part of the State. The company became embarrassed some years ago, and the State recently bought the property and many acres about it for a forestry reservation. It was last operated under George Wiestling, who rebuilt it.

The Landis Tool Company of Waynesboro have made the largest grinder ever built by the company for the Nordberg Mfg. Company of Milwaukee. It weighs 25,000 pounds and is to finish engine parts. The Allis-Chalmers Company of Milwaukee have ordered a similar machine.

Lebanon works are generally busy and everything

A. W. Jackson, H. B. Reynolds and John O'Malley, Scranton.

Coatesville Brass Company, Coatesville, capital \$5,000; directors: James, Samuel and Walter E. Greenwood and Orville H. Daggett and William H. Denn, Coatesville.

H. Muhr's Son, Incorporated, Philadelphia, capital \$10,000; directors: Jacob Muhr, Ralph Binder, James H. Atkinson, Howard E. Young and C. William Funk, Philadelphia.

Ridgway Machine Tool Company, Ridgway, capital \$300,000; directors: W. S. Thayer, E. R. Smith, H. R. Hyde, J. K. Gardener, R. J. Powell and John Curry, Ridgway, and C. M. Conradson, Madison, Wis.

David Lupton's Sons Company, Philadelphia, capital \$325,000; directors: Edward, David E. and David Lupton, E. T. Wilkinson and Thomas B. Harbison, Philadelphia.

George P. Schmidt Company, Allegheny, capital \$1,000; directors: George P. Schmidt, John Feldheimer, Herman R. and Edward C. H. Schmidt, Allegheny.

Alex. H. Irvin Company, Curwensville, capital \$10,000; directors: Alex. H. Irvin, Fred. J. Dyer and J. A. Frank, Curwensville.

The Pittsburgh Doremus Automatic Vending Machine Company, Pittsburgh, capital \$250,000; directors: H. K. Childs, Pittsburgh; Charles A. Disbrow, John A. Affleck, C. Howard Lloyd, Edwin W. Jackson, William J. Pavord, D. S. E. Parthemore, Harrisburg.

Lebanon Valley Iron Company, Lebanon, capital \$75,000; directors: Samuel and J. Warren Light and William S. Davis, Lebanon.

Wilkes-Barre & Scranton Coal & Iron Company, Scranton, capital \$75,000; directors: Thomas F. Toerry and Abel I. Culver, New York; J. George Elsele, James Kearney and John G. McAskle, Scranton.

Lancaster Electric Supply & Construction Company, Lancaster, capital \$6000; directors: John E. Hess, John R. Kreider and Harris Boardman, Lancaster.

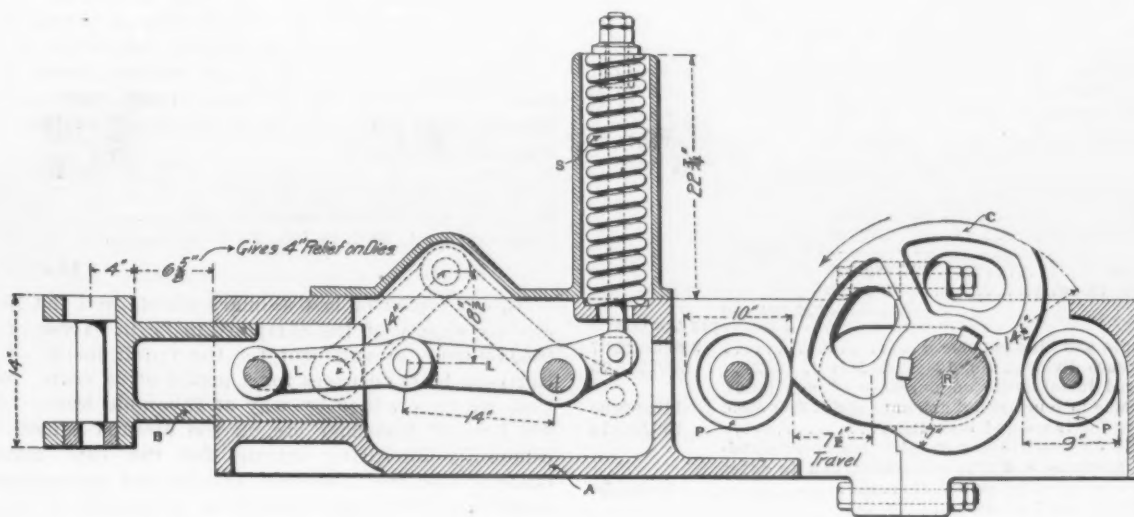


Fig. 2.—Section Showing Cam Operating Plunger and the Automatic Relief.

#### THE ACME BOLT HEADING, UPSETTING AND FORGING MACHINE.

seems rosy for the fall if one labor trouble can be settled. Extensive improvements are under way at the Colebrook furnaces and additional tracks show their extent. The new Lebanon Valley Iron Company will start business soon. Frederick Wunderlich has bought the Mish foundry, Seventh and Willow streets, and will establish a new foundry this fall. The West End rolling mill of the chain company shipped eight carloads of large chains to the Pacific Coast last week, it being the largest consignment ever sent that distance by the plant. The same mill is working on Government orders.

An incident of the week in the Lancaster County district was the starting of the Marietta Hollow Ware & Enameling Company's works. James Duffy, the president, refusing to recognize the striking molders as organized, offered work to individuals and with 22 men started in the molding room, working himself in the overalls of the men. The works are now running.

#### New Manufacturing Companies.

The following companies were chartered by the State of Pennsylvania in July:

Otterman Mfg. Company, Bridgeville, capital, \$15,000; directors: A. R. Otterman, C. P. Mayer, John B. Knepper, Bridgeville; W. F. Sossong, H. J. Verner, Carnegie.

Freeman-Holden Company, Philadelphia, capital \$10,000; directors: Nicholas Holden, Joseph J. Freeman and Cecelia Helm, Philadelphia.

Perfection Welding Compound Company, Scranton, capital \$5000; directors: C. H. Pond, George S. Atkins,

000; directors: Alex. H. Irvin, Fred. J. Dyer and J. A. Frank, Curwensville.

The Pittsburgh Doremus Automatic Vending Machine Company, Pittsburgh, capital \$250,000; directors: H. K. Childs, Pittsburgh; Charles A. Disbrow, John A. Affleck, C. Howard Lloyd, Edwin W. Jackson, William J. Pavord, D. S. E. Parthemore, Harrisburg.

Lebanon Valley Iron Company, Lebanon, capital \$75,000; directors: Samuel and J. Warren Light and William S. Davis, Lebanon.

Wilkes-Barre & Scranton Coal & Iron Company, Scranton, capital \$75,000; directors: Thomas F. Toerry and Abel I. Culver, New York; J. George Elsele, James Kearney and John G. McAskle, Scranton.

Lancaster Electric Supply & Construction Company, Lancaster, capital \$6000; directors: John E. Hess, John R. Kreider and Harris Boardman, Lancaster.

The exports of German iron and steel to Russia have been falling off heavily in recent years. In 1898 the exports of bars, angles and sheets and plates amounted to 200,189 metric tons. They declined to 147,832 tons in 1899, to 62,827 tons in 1900 and to 53,516 tons in 1901.

The Fort Pitt Natural Gas Company and the Manufacturers' Light & Heat Company have advanced the price of natural gas from 22½ to 25 cents per 1000 cubic feet, net, in the Pittsburgh district, thus equaling the rates charged in that city.

## Republic Iron & Steel Company.

The semiannual report of the Republic Iron & Steel Company for the six months ending June 30, 1902, has just been issued. The profit and loss account shows:

Profits after deducting expenses, except improvements, renewals and repairs.....	\$1,840,526.61
Less amount charged during the six months to operating for improvements, renewals and repairs.....	524,818.60
Net balance.....	\$1,315,708.01
Deduct dividends, April and July, 1902.....	712,491.50
Surplus.....	\$603,216.51
Surplus December 31, 1901.....	1,331,172.64
Total surplus.....	\$1,934,389.15

The general balance sheet shows:

Assets.	
Real estate, plants, buildings, machinery and other permanent investments.....	\$41,411,333.44
New construction:	
May 1, 1899, to June 30, 1900.....	\$1,218,203.44
July 1, 1900, to June 30, 1901.....	1,164,175.26
July 1, 1901, to December 31, 1901.....	1,236,231.49
January 1, 1902, to June 30, 1902.....	766,952.46
	4,385,562.65
Stocks in Sunday companies at cost.....	162,200.00
New gas pipe lines and gas leases and prepaid royalties on ore and coal in excess of the amounts charged to operating.....	322,424.47
Inventories of raw and finished materials.....	3,046,649.61
Accounts and bills receivable.....	3,359,215.98
Cash on hand.....	1,125,185.65
Total.....	\$53,812,571.80

Liabilities.	
Capital stock issued:	
Preferred.....	\$20,852,000
Less in treasury.....	495,100
	\$20,356,900
Common.....	\$27,352,000
Less in treasury.....	161,000
	\$27,191,000
Accounts and bills payable.....	\$47,547,900.00
Preference dividend No. 12 (paid July 1, 1902)...	3,636,322.97
	356,245.75
Deferred installments on purchase of coal lands, payable in four annual amounts of \$37,000 each.....	148,000.00
Reserve for taxes and insurance.....	120,380.14
Reserve for possible loss in collection of outstanding accounts and bills receivable, and to cover unknown contingencies.....	69,333.79
Profit and loss account:	
Net profit during the last six months.....	\$1,315,708.01
Deduct two quarterly dividends of 1% per cent. each on preferred stock.....	712,491.50
Surplus created during the last six months in excess of dividends on preferred stock.....	\$603,216.51
Add surplus on the books on December 31, 1901.....	1,331,172.64
	1,934,389.15
Total.....	\$53,812,571.80

Alexis W. Thompson, the president of the company, in his report for the six months, says:

### New Construction.

The most important events in the history of the company during the last six months have been the completion of the new large blast furnace and other improvements in Birmingham, and of the new billet mill at Youngstown.

The new blast furnace, designated as Pioneer No. 3, has a daily capacity of 300 tons. It is furnished with all modern equipments and every approved labor saving device. It was blown in on June 13, 1902, and has since been successfully operated. We do not hesitate in saying that its efficiency and appointments are superior to those of any other furnace in the South.

We have also installed two new blowing engines at our Pioneer Furnaces, Nos. 1 and 2, thereby greatly increasing the capacity of these furnaces. We have enlarged our coking plant at Birmingham so as to have a battery of 910 ovens.

During the six months, we have completed the opening of the Pratt seam of coal in the Birmingham district, and are now mining 2000 tons of coal per day from this seam as well as 1200 tons per day from the Newcastle seam. The coal from both seams is washed and sent to our ovens at the furnaces, producing coke of superior

quality and in sufficient quantity for all our requirements.

The billet mill is operated in connection with our steel plant at Youngstown, and is recognized to be the most efficient mill now in operation in the country. It was successfully started during the month of April, 1902.

The company are now commencing to derive the benefits of these important additions to their plants, and during the next 12 months they will be further strengthened by the enlargement of their Bessemer plants from the present daily capacity of 1000 tons to an average daily capacity of 1500 tons, by the construction of three new continuous mills of the standard Morgan Engineering Company's type, and of another such mill at the company's Moline plant, to supply the large local demand at that place. The contracts for this additional new construction work on our books on June 30, 1902, amount to \$574,612.04.

The total sums expended for entirely new construction since the organization of the company in 1899 up to the date of this report, amount to \$4,385,563.

### Condition of the Old Plants.

The old plants of the company, which are geographically well located and best fitted for economical production, have, ever since the organization of the company, been maintained in the best physical condition. In this way the sum of \$2,470,881.45 has been expended for reconstruction, improvements and repairs, which has all been charged to operating and written off against profit and loss as follows:

From May 1, 1899, to June 30, 1900.....	\$893,013.89
From July 1, 1900, to June 30, 1901.....	566,622.54
From July 1, 1901, to December 31, 1901.....	486,426.42
From January 1, 1902, to June 30, 1902.....	524,818.60
	\$2,470,881.45

In our report of last January we showed the Northern ore supply of the company to be in excess of 14,000,000 tons, or sufficient for the requirements of our Northern blast furnaces for a period of 28 years. Since then we have added by way of favorable leases 1,000,000 tons of Bessemer ore on the Mesaba range. The constantly increasing demand for the raw material entering into the production of iron and the constantly increasing drain upon the fields of supply by the increased consumption thereof, as well as other recent developments, indicate that the estimate in our last semi-annual report of \$21,750,000 as the value of the raw material in the ground then and now owned and controlled by this company was certainly moderate and safe.

The balance sheet shows the exact condition of the company as of June 30, 1902. The inventories stand on the books and are so stated in the balance sheet at cost prices for raw material and at less than cost prices for finished material, which are considerably below the present market. From the profit and loss statement it will be seen that the profits derived from the operations of the company during the last six months have not only been sufficient to provide for the payment of the preferred dividend but have also increased the surplus of the company to almost \$2,000,000. All our properties are free from mortgage indebtedness, and as the available quick assets are largely in excess of the floating indebtedness, the financial condition of the company can be considered as satisfactory.

The orders now on our books, as well as the general condition of the business, the decreased cost of production and the increased tonnage to be derived from new construction, justify the expectation that our earnings during the next year will be sufficient to pay the preferred dividend and the cost of the new improvements in process of construction, and also to add substantially to the available resources of the company.

Last week the American Steel & Wire Company shipped by river from their Rankin works, at Pittsburgh, a number of barges loaded with wire and wire nails and consigned to St. Louis, where the American Steel & Wire Company have a large warehouse, from which wire, nails and wire fencing are distributed to various Southern points.



# The Iron Age

New York, Thursday, August 7, 1902.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	-	-	-	-	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,	-	-	-	-	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	-	-	-	-	BUSINESS MANAGER.

## Gold Exports and the Money Supply.

The payments of loans negotiated in Europe to assist in large financial operations here and the sale of securities by Europeans to Americans are given as the reason for the exports of gold. Of these two the latter must be much the more important. It is known that London has been a large seller, as it naturally would be if it had anything to spare, considering the eager demand for everything there is in this market. The only cause of surprise is that London still has plenty of securities to sell after all the selling she has been doing and the conclusions of financial writers that England is nearly denuded of foreign securities. Still these are relative terms. An export of gold of \$5,000,000 or \$10,000,000 makes a good deal of show, while a decrease of \$5,000,000 or \$10,000,000 in the amount of foreign securities held in London and other financial centers would be very insignificant in comparison with the whole. The repayment of loans negotiated in Europe is a secondary factor, for the loans were probably effected by transfers of credits and they might have been expected to be settled in the same way.

But the United States is one of the great gold producers of the world, and after supplying its own monetary and industrial requirements has the same occasion for exporting gold that it has for exporting pork and grain, while Western Europe is obliged to import gold to meet industrial requirements, and provide for not only maintaining but increasing the gold reserves in the great monetary centers, as they must increase with the growth of population and business and the prospective retirement of silver. For while no new policy regarding silver is announced, or is likely to be, France understands that she is carrying an enormous mass of token coins, and the more gold there is in the Bank of France the better able will the country be to deal with the silver problem when it can no longer be postponed.

During July the total monetary gold in the country, according to the Treasury statements, increased over \$5,000,000, the decrease in that owned by the Government being \$4,000,000 and the increase in the amount in circulation being \$2,000,000 in coins and \$7,000,000 in certificates. Other features of the change are not important or interesting except one—there was an increase during the month of considerably more than \$2,000,000 in the national bank circulation. In June there was a slight decrease. In 12 months ending July 1 the increase was less than \$3,000,000 and the amount in process of retirement had increased. Our currency has little elasticity, but in July it increased something over \$8,000,000, nearly all in gold and national bank notes, and the disposition of the banks to increase their note issues as the season of largest currency demands approaches is of some importance.

In an editorial in the issue of July 31 we discussed the report of a committee appointed to ascertain the facts in relation to water tube boilers in the British Navy. That report condemned the Belleville boiler in

particular and recommended that no water tube boiler be used until the type had been perfected. In this connection it is interesting to note the extent of the employment of water tube boilers in the different navies as compiled by Lieut. Charles W. Dyson and published in the *Journal* of the American Society of Naval Engineers. The Babcock & Wilcox heads the list in our own navy, 19 vessels being fitted with this type. Among these are the protected cruiser "Milwaukee," of 21,000 horse-power, and the battle ships "New Jersey" and "Rhode Island," of 19,000 horse-power. The same type is also used on the British battle ship "Queen," of 15,000 horse-power, and the cruiser "Challenger," of 12,500 horse-power. The Belleville boiler is used in 144 ships, nearly one-half of which belong to the English Navy. Of this type the French Navy has 34 vessels, Russia has 27, Japan 10, Austria, Italy and Chile 4 each, Germany 2 and Argentina 1. Most of these are ships of large powers. The Durr boiler is in 6 German and 2 Austrian ships; the Blechynden in 8, the White in 4, the Guyot-Du Temple in 4, the Lagrafel D'Albest in 22, all French; the Laird in 5, the Niclausse in 34, the Normand in 35 ships and 8 torpedo boats, the Normand-Sigaudy in 5, the Reed in 22, the Schichau in 1, the Orliole in 4, the Schultz in 7 and the Thornycroft in 55. The Yarrow boiler is used in 44 vessels. A communication from the Thornycroft Company to *Engineering* states that the composite plan of using both water tube and cylindrical boilers, recommended in the report, has been employed in 13 German battle ships and 1 armored cruiser. The power represented by the water tube boilers was originally about 35 per cent. of the whole, but in the more recent ships this has been increased to 60 or 70, while in the latest the cylindrical boiler has disappeared altogether. All of which shows that the other navies of the world have no difficulty with the water tube boiler, as the British Navy has, and that this type is taking the place of the cylindrical boiler.

## The Gas Engine in the Rolling Mill.

The technical press has borne testimony during the past few years to the vigor and high intelligence with which the Germans have taken hold of the problem of utilizing waste blast furnace gas in their furnace plants and steel works. There are magnificent installations in that country, but thus far it has been understood that the gas engine, in large units, has been employed exclusively in two directions, that of driving blast furnace blowing engines and in operating the dynamos for the electric service at furnaces, steel works and rolling mill machinery. Of course the furnaces have had the incentive of very high fuel prices to urge them to a thorough utilization of the coke charged into their blast furnaces. Yet with all that credit must be freely accorded to them for the energy and skill which they have brought to bear upon many perplexing if minor problems involved.

It is interesting to note that they have gone a step further, and with apparent success, by employing the gas engine, using waste blast furnace gas, for driving roll trains. An account of such an engine, which has been in regular operation at a German mill since April, 1901, is given in a recent issue of *Stahl und Eisen*. Of course no attempt has been made to apply a gas engine to those requirements in rolling mill work in which sudden and heavy fluctuations in power are frequent. But the claim is made that it may be very advantageously used to supplant fly wheel steam engines for driving sheet, rod and bar mills. The particular gas engine described



is a horizontal tandem fly wheel four-cycle engine coupled direct to the train. It was built by the Augsburg & Nuernberg Company, and at a speed of 120 revolutions develops 600 to 700 horse-power. The two cylinders are 35.4-inch bore and have a 39.4-inch stroke, the diameter of the fly wheel being 21 feet. The regulation is effected by a mixing valve. Our contemporary prints diagrams which certainly show excellent work.

We cannot help regarding this latest development of the gas engine into rolling mill works as significant. It is a further step in putting those localities that suffer from high fuel cost upon a closer parity with the sections blessed with cheap coal.

### The Battle of Gun and Armor.

In the old days of wooden fighting ships protection of vital points was sometimes obtained by chains hung over the sides. The arrangement was clumsy, but it placed the boat ahead of the gun, and it was no longer possible to send a shot clear through the ship. The demand for a more effective method resulted in the adoption of side armor, which has passed through regular stages of evolution made necessary by the increased power of the gun. From that time to the present the race between gun and armor has been a most exciting one. No sooner would an advantage be obtained by one than the other would be improved and take the lead. The introduction of Krupp armor plates placed the ship decidedly in advance, but the capped shell and high explosives came along to make the fight more even and exhilarating.

We have heard much concerning the wonderful work done by the soft nose armor piercing shell packed with "explosive D" and fitted with the delayed action fuse. Both of these were discovered by officials of the navy and the nature of both is very properly kept secret. Krupp plates have been pierced with their aid, which is infinitely more important than the cracking or even shattering of the plate. It is a self evident proposition that a high explosive within the ship is capable of vastly greater destruction than the same explosive outside. The aim, therefore, has been to force the shot completely through the armor, and when inside to explode the charge. The accomplishment of this placed the gun in the first position.

Hardly had this news become cold before dispatches from Washington announced a new method of hardening armor plates which possessed advantages far exceeding those obtained by the Krupp process. By the latter method the plates must be kept at a high heat for several days, thereby making the work expensive and tedious. As explained in the dispatches the new process, discovered by Lieut. Cleveland Davis of the navy, is a carbonizing one, in which the depth and degree of carbonization can be regulated. Further, the work can be performed in a comparatively short time and with simple apparatus, thereby reducing the cost considerably. This plan employs high electrical currents, forming an arc between two carbon points. This arc is passed over the plate, which is in a heated condition. It is claimed that by this process a portion of the carbon of the points is transferred to the metal, the extent of penetration being controlled by the length of time of the treatment. The result is a plate having a wonderfully hard surface, which is backed and supported by soft steel, so that danger of cracking is eliminated. Ballistic tests of a 5-inch plate proved so satisfactory as to warrant the development of the process. Lieutenant Davis estimates that he can save from 20 to 50 per cent. in the

weight of a plate having a resistance equal to that obtained with the Krupp method.

So it may be that the gun has again been deposed and that the armor has assumed the leading position. But the new process is yet in the experimental stage and it is too early to state positively its advantages.

## CORRESPONDENCE.

### The Klatte Process of Rolling Chains.

To the Editor: Having read with great interest the article concerning the manufacture of chains in your journal for July 3, I beg to present the following supplementary information, as I am named with my invention in the article:

The process of rolling chains was accomplished successfully in the years 1893-4, and the unimpeachable value of the rolled chains was tested by the English, German Lloyds and Veritas assurance companies, German Government testing works, Imperial German marine, chain cable navigating, shipbuilders, railroads, mining and force companies, &c. But the unfavorable geographical situation and the financial state of the Germania Works, at Neuwied on the Rhine, and the reaction in business in Germany did not permit the erection of a sufficient plant and therefore I turned to England, where the Rolled Weldless Chain Company, Newcastle-on-Tyne, was established. This enterprise also suffered from insufficient capital, but in spite of this the works there were fitted up to be able to manufacture the largest cable chains of 2½ to 2¾ inches, English link size.

The rolling mill plant was successfully put to work, as was stated at the time in *Stahl und Eisen*, and trials were begun to prove the cheapest manner of finishing. The construction of special machines for this purpose and the making of the rolls required much time. The finishing of rolled chains may be accomplished when desired either cold or hot. I believe that no other process would reach the speed and the low cost of the rolling process (ten seconds for rolling of a chain bar). It is evident that the heavier the chain the cheaper it can be rolled. I expect to make the shortest rolled link chains in the world, beginning from ⅝-inch size to the greatest dimensions which will be required and to make rolled cable chains with link and stud in one piece up to 2¾ inches, English size. All the rolled chains have thickened ends, which gives them twice their life in wear. The rated strength for the welded chains is 10,000 to 12,500 pounds per square inch, while with the rolled homogeneous steel chains we can go to 38,400 pounds per square inch, keeping below the elastic limit. It cannot be equaled for war ships, since the lessened weight of the cable chains, or may be assigned to more coal or guns. The chain bars are rolled so that the breadth of the links lies in the direction of the rolling and thus the chains are made two-fifths longer in one piece than hitherto and the length is dependent upon the plant, the furnaces and the requirements, so that it will be very seldom necessary to provide for any connecting link. Besides I have patented a new connecting link, which is stronger than even the chain itself. For cable chains there is used as connecting link in double application the well-known ordinary connecting shackles, which can be loosened by drawing out a bolt. This does not involve any difficulty.

I have not referred to the wire connecting link patented by me, because the manufacture of it on ships is too difficult and would involve too great a waste of time, besides the strength is insufficient.

I can furnish from one open hearth furnace charge, for example, a chain of 1-inch size in one length of 1000 meters—equal to 3300 feet, one link like the other.

The Board of Trade in England ordered a strength from 60,000 to 67,000 pounds per square inch. The best test on basic open hearth steel has been a tensile strength of 88,900 pounds per square inch with an elongation of 20 per cent. Accepting 38,400 pounds as a basis for rolled weldless chains this gives an additional factor of safety of two. With welded chains it is customary to require a factor of safety of four to five, on

account of the welds, but how often is that not adequate? Other kinds of chains have never reached more than welded chains.

The rolled chains may be made also from other metals or alloys in order to provide against corrosion by acids or sea water.

The English company have furnished rolled weldless chains in a satisfactory manner to railways, shipbuilders, mines, &c., and the Chief of Construction of the English Marine has asked the Admiralty to introduce rolled weldless chains.

O. KLATTE.

DUESSELDORF, July 15, 1902.

## Modern Developments in the Production of Open Hearth Steel.\*

BY JAMES CHRISTIE, PHILADELPHIA.

All malleable forms of iron and steel as now produced in commercial processes are made from the products of the blast furnace—that is, they are all produced from cast iron. Former methods of producing malleable metal direct from the ore, which lingered until recent date from the earliest recorded times, are now practically extinct. There are three existing commercial methods for refining cast iron and producing the malleable product—viz., the puddling or boiling process, the Bessemer process and the open hearth process. By these three processes, in a commercial sense, all the malleable forms of iron are now made, and of the entire products of the blast furnaces, now aggregating about 1,500,000 tons per month in this country, about one-half passes through the Bessemer converter. Over one-fourth of the total product passes through open hearth furnaces, and three-fourths of the whole open hearth product is made in basic lined furnaces, the other fourth being produced from acid lined furnaces, the latter being the original form of the open hearth furnace as at first perfected.

During the reduction of iron ores in the blast furnace the metal is associated with numerous metalloids, which are generally derived from the original ores. The most important of these, or those that are frequently dealt with in ordinary chemical analyses, are carbon, silicon, manganese, phosphorus and sulphur. The pig metals desirable in ordinary basic open hearth practice will average about the following chemical composition:

Carbon.	Silicon.	Manganese.	Phosphorus.	Sulphur.
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
3.5 to 4	0.5 to 1	0.0 to 0.5	0.5 to 1	0.05 to 0.1
0.1 to 0.3		0.4 to 0.6	0.04 to 0.08	0.04 to 0.08

It is desired to eliminate the metalloids in the original pig, and for the production of steel having qualities suitable for ordinary structural purposes the metalloids should be reduced to the percentages given in the second line above. Carbon, silicon and manganese, having a high affinity for oxygen, at high temperatures are readily removed from the metal by the oxygen of the atmosphere. Phosphorus and sulphur, however, have a strong affinity for the iron, and they cannot be removed by atmospheric oxidation. Moreover, as they are acids in a chemical sense—that is, they form acid compounds when oxidized—it is necessary to expose them, when at a high temperature, to the action of lime, or other powerful mineral bases that have such an active affinity for them as to pull them away from their association with the iron. Until a recent period the refractory linings of our furnaces were made of silicious materials which were also acids in a chemical sense, and it was impossible to use the powerful mineral bases in this form of furnace without fluxing and destroying the lining of the furnace. Consequently, in the original acid furnace it was necessary to use only such metals as were sufficiently low in phosphorus and sulphur to yield a satisfactory finished product.

### The Chemical Reactions.

The large majority of our iron ores contain considerable proportions of these objectionable elements. As the necessity of working these ores became pressing it resulted in the development of the basic furnace—that

is, a furnace whose refractory linings were mineral bases, and these are usually either magnesite or dolomite, the latter a compound of lime and magnesia. The use of these basic linings permits of the addition of large quantities of lime to the molten metal, and also permits of much larger additions of oxides of iron, such as ore, mill scale, &c., than could be tolerated in the acid lined furnace. By the use of these reagents the excess of phosphorus and to some extent that of the sulphur can be reduced and permits the utilization of large quantities of ores that could not otherwise be handled, with a resulting product of unquestionable excellence if the process is properly carried out.

The higher the percentage of the metalloids, especially carbon and silicon, associated with cast iron, the lower the melting point will be and the lower the specific gravity of the metal; and also, in a general sense, the metal is softer and has a lower tensile strength. As we eliminate the metalloids the temperature of the melting point is elevated and the specific gravity is increased until we approach the condition of pure metallic iron, when the melting point and specific gravity will be maximum. When all the silicon and a little over half the carbon usually present in the pig iron are removed the metal approaches the condition of high carbon steel, when the tensile strength is maximum. As the carbon is still further removed the tensile strength lowers, but the ductility of the metal is increased.

A large proportion of steel used for structural purposes at the present time is basic process open hearth steel, having a tensile strength averaging about 60,000 pounds per square inch of section and containing from 0.1 to 0.3 per cent. of carbon. Briefly, then, the action of refining cast iron consists in reducing the carbon content to the desired point, which is done either by removing almost entirely the whole original content and adding sufficient to bring it to the requisite standard, or else maintaining the desired proportion of the original carbon. The silicon is all oxidized and sometimes a small percentage restored for specific purposes. The manganese is readily removed by the oxygen of the atmosphere, and a considerable proportion, usually from 0.4 to 0.6 per cent., has to be restored, as the presence of manganese is necessary as a general corrective, and steel of a satisfactory quality is not made either by the Bessemer or by the open hearth process without the addition of manganese. Phosphorus and sulphur are removed as far as possible. These constituents cling very tenaciously to the metal, and, as their presence above very minute percentages is very objectionable, their elimination is one of the most difficult problems the metallurgist has to deal with.

It will be observed that the low carbon steel now used so extensively for structural purposes has a very high melting temperature, and the manufacture of this metal has been rendered practicable by the development of furnaces in which the necessary high temperatures can be produced and maintained. In fact this is the essential distinction between the puddling process and its successor, the open hearth furnace and process. In the former, as the metalloids are removed by oxidation, the separated metallic iron is never at a high enough temperature to be in the molten condition. It is simply a pasty mass of open iron sponge which is welded together. Therefore the refining of iron as performed in the puddling furnace is a process of welding or agglutination, and the metal is handled in the solid condition, whereas in the open hearth furnace it is a fusion process and the metal is produced from the furnace in a molten condition.

### The Puddling Furnace.

We might very briefly review the development of the puddling furnace, as there is a very close analogy between this and modern developments in the open hearth furnace. About a century ago, when the puddling furnace was in its primitive form, the metal was treated in a furnace hearth, whose sides and bottom were of silicious materials, in many respects comparable in a humble way to the acid open hearth furnace. With this original type of puddling furnace no metals except those

\* Read before the Engineers' Club of Philadelphia.



of the highest grade—that is, free from objectionable metalloids—could be handled, nor could any reagents of a basic character be used in the furnace. Early in the last century the puddling furnace developed to a higher stage. The bottom was formed of iron plates, protected by a coating of oxide of iron cinder, and the walls of the hearth were protected with nonsilicious materials. This was a distinct advance in the art, and the process was usually associated with a preliminary refinery treatment, which removed a large part of the carbon and silicon and facilitated the final treatment in the puddling furnace. It was not the custom to use large quantities of oxides of iron, and the slag produced being small in quantity it was subsequently customary to denote this process by the term of dry puddling. Toward the middle of the century a further development took place. The walls or jambs of the furnace were built of high grade iron ore and large quantities of iron ore and mill scale, or other suitable oxides of iron, were added to the charge, resulting, when the proper temperature was reached, in a very active reaction or boil, with the separation and discharge of considerable quantity of slag. It was customary, therefore, to term this process "boiling," and the workmen in some places were called "boilers," in contradistinction to the old form of dry puddling.

The essential distinction was that in the former process more reliance was placed upon the atmosphere as an oxidizing agent, and in the latter the oxides of iron, added to the charge, formed the oxidizing agents, with distinct economical advantages in reduction of labor, improvement in quality of product and in the yield of product, inasmuch as the waste of metal from atmospheric oxidation was fully compensated by the addition of metallic iron recovered from the oxides. This final development of the puddling furnace was a basic process; in fact, it was quite common in certain districts to add considerable proportions of lime compounds to the charge, as a dephosphorizing agent. The further development of the puddling process as a mechanical operation was arrested by the rapid introduction and growth of the open hearth furnace and the displacement of puddled iron by Bessemer and open hearth steel.

The introduction and development of the open hearth furnace were coincident with, or succeeded very closely, the Bessemer process. It has now had a commercial existence of a little over 30 years. For about half this period operations were confined entirely to the acid process—that is, a furnace whose linings were of a silicious character. When it is remembered that there are but few deposits of ores that do not carry higher proportions of phosphorus, and frequently sulphur, than can be tolerated in the finished metal, and that the phosphorus content of the original ores will be largely found in the final product of acid process steel, it can be readily understood why strong incentives existed for a furnace lining that would permit the addition of basic material to the metallic charge. The desired lining material was found in magnesite and dolomite, and the former especially has taken precedence as the most suitable refractory for basic furnace linings.

As the basic lined furnace was improved and developed and the necessary refractories produced in better shape for prolonged endurance, it became customary to increase the additions of lime and oxides of iron in the charge, just as obtained with the final development of the puddling furnace. This resulted in very active boils or reaction in the furnace, accompanied by the separation of large quantities of frothy slag, which greedily absorbed the carbon, silicon and manganese in the original pig iron, and also, but more slowly, absorbed the phosphorus and a part of the sulphur.

It was found to be desirable to separate the impure slag thus created from the bath of metal—first, as a necessity on account of its bulk; second, to remove it as a covering from the metallic iron, leaving the latter more fully exposed to heat influences; third, to permit the addition of fresh basic charges as the original slag had become partly satisfied with the impurities that it had so greedily absorbed.

Rolling and tilting furnaces are now extensively

used and are favored under certain conditions, or for the purpose of facilitating special methods of working.

The following advantages are claimed for the rolling furnace: A portion of the charge can be tapped if desired. The slag can be retained or prevented from entering the ladle. The excess of impure slag can readily be tapped off before the heat is finished. The hottest metal at the surface of the bath being drawn first, some maintain the mixture in the ladle is more uniform than when tapped from the fixed furnace.

The objections to this form of furnace are the greater first cost and the somewhat greater expenditure for maintenance and repair.

#### Expediting the Open Hearth Process.

The principal objection to the open hearth furnace is that the process is a tedious one, and the efforts of the manufacturer have been devoted to expediting the process to obtain larger products in a given time and economize the production. Numerous experiments have been made by charging liquid metal either direct from the blast furnace or the cupola or metal partially purified in the Bessemer converter. Until a recent period none of these experiments have been entirely satisfactory. By using liquid cast iron with the ordinary process the refining has not been facilitated so much as was anticipated, for it will be remembered that there is some refining action before fusion occurs when the metals are charged cold. Furthermore, there was erosion of the bottoms if liquid metal was poured into an empty furnace. This difficulty was augmented when partially blown Bessemer metal was used, inasmuch as it was both heavier and hotter than liquid cast iron. It was also found that the elimination of phosphorus in the open hearth furnace was very slow and tedious when Bessemer metal was charged, as the phosphorus seems to cling more tenaciously at high than at low temperature. Nevertheless, in the final development of the basic open hearth furnace liquid cast iron is largely used, and the general features of the various methods practised might be roughly described as follows:

The modern methods for expediting the process of refining, though varying much in the details, in a general sense consist in charging in the basic furnace large masses of molten iron with liberal additions of oxides of iron, such as ore, mill scale, &c., together with suitable additions of lime or dolomite. These additions form a highly basic slag, which rapidly absorbs the bulk of the metalloids in the cast iron. An active boil or reaction now occurs, and the large mass of slag thus created and partially saturated with impurities is then separated from the partly refined iron, and the latter, separated from the impure slag, is then boiled down and treated in the usual way to the required condition. The chief distinction in modern open hearth practice, as compared to former methods, consists in the larger use of liquid metal and in the larger quantities of solid oxides used as reducing agents. The use of the latter, of course, is only possible in the basic lined furnace. The use of solid oxides instead of the atmospheric oxygen not only prevents a waste of iron that would otherwise occur, but in fact augments the product of iron delivered from the furnace by the transfer of a portion of the metal in the ore to the metallic charge. It is common practice now to draw from the furnace, in refined metal, full weight of the crude metal charged; in fact, frequently several per cent. in excess of the charge is produced from the furnace. It will be observed that there is a very close analogy between this operation and that of the most highly developed stage of the puddling process. There are several specific processes now frequently quoted, the most prominent being the Bertrand-Thiel process, the Talbot process and the Monell process.

#### Bertrand-Thiel Process.

This process originated at Kladno, Bohemia, in 1894-95. Two basic lined open hearth furnaces are used, one being a primary or rough refining furnace and the second a finishing furnace. Into the primary furnace is charged pig iron, preferably molten blast furnace metal, and sometimes a small portion of scrap, if desired together with a liberal addition of ore, or other oxides of iron and limestone. Into the finishing furnace is charged



scrap and sometimes additions of pig, with a small quantity of limestone and ore. In a general way the most impure materials are charged into the primary furnace and the purest materials into the secondary furnace.

The primary furnace is heated for about three hours, when the highly basic slag absorbs most of the silicon and carbon, and the other metalloids are considerably reduced. The finishing furnace is charged later than the primary, and its contents brought to a pasty or molten condition. The primary furnace is then tapped and its metallic charge run into the finishing furnace, all of the slag of the primary being retained or skimmed off. When the two metals mix in the finishing furnace a rapid reaction ensues for about a quarter of an hour, when the phosphorus content is then generally reduced to a satisfactory minimum. The heat is then finished by additions of ferromanganese or spiegel and tapped in the usual way. The metallic charges, as in all processes of this kind, depend upon the relative values of pig and scrap. When scrap is dear, none is charged into the primary, or *vice versa*; or the charge of the secondary may contain no pig.

The general theory of this process is to perform the rough work on the most impure materials in a separate furnace and to prevent the impure slag thus created from affecting the rapid finishing of the partly purified metals in the secondary furnace. Recent reports upon this process, operating with two furnaces of 15 tons capacity, show an average product of eight heats per day from the combined furnaces, or 48 heats per week, or an average product of about 720 tons per week. Blast furnace metal of the following composition:

Carbon.	Phosphorus.	Silicon.	Manganese.
3.5	1.5	1	0.4

when run out of the primary furnace, is refined as follows:

Carbon.	Phosphorus.	Silicon.	Manganese.
2.4	0.10 to 0.20	Trace.	Trace.

The ore charged contains about 65 per cent. metallic iron and is approximately about one-fourth of the weight of the metallic charge, and limestone about 10 per cent. of the metallic charge; spiegel and ferro-manganese, about 2.5 to 3 per cent. of the metallic charge. Over one-half of the sulphur content of the metal is usually removed in the process. There is a large discharge of slag from the primary furnace which usually contains considerable phosphoric acid and is valuable as a fertilizer. It is claimed that by this process the fuel and limestone and refractories are somewhat reduced, as compared to the older method, and the output increased over the ordinary single furnace method about 70 per cent. The process seems to be especially advantageous when very impure materials have to be treated.

#### Talbot Process.

A rolling furnace of large capacity is desirable. Furnaces of 70 to 100 tons capacity are now in use; one of 200 tons capacity is ready for operation, and even larger furnaces are considered. The initial charge having been boiled down to a finish in the usual way, a steel cast of one-fourth or more of the total charge is made, the slag being retained in the furnace. After pouring, a charge of solid oxides of iron, such as ore or mill scale, or heating furnace cinder is added and melted; also an addition of limestone, and through this highly basic slag the fresh charge of molten iron is poured. A very active ebullition or reaction follows for a period of 10 or 15 minutes, during which almost all the silicon and a portion of the other metalloids are oxidized or taken up by the slag from the molten iron. A large part of the slag thus created is drawn off. Fresh additions of oxide of iron and lime are charged and the whole charge worked down to finished steel in the usual way. Then a portion of this finished steel is cast as before and the process repeated continuously. From a furnace of 70 tons capacity, metal charges and steel casts of 20 to 30 tons are made, with a product of over 30 20-ton heats, or about 650 tons per week. This is made from pig iron having the following average composition:

Carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.
3.7	1	0.06	0.90	0.40

With the above amount of molten pig per week will be used about 80,000 pounds iron ore, 10,000 pounds man-

ganese ore, 120,000 pounds of cinder and scale, 100,000 pounds of limestone, and 5000 pounds of ferromanganese and silico-spiegel, the average results being 106 per cent. yield, or 6 per cent. more steel product than the weight of the pig metal charged. This process is best adapted for handling pig metal alone. Scrap can be passed through the cupola, if a cupola is used for melting, and, if desired, preheated scrap should be charged.

#### Monell Process.

By this process either pig and ore or pig and scrap can be used, as desired. Limestone and a large quantity of iron ore are charged on the hearth of a basic furnace and the charge heated until it is pasty or nearly fused. On this heated material is poured the full charge of the furnace of molten iron. A rapid reaction occurs and the impure slag thus created is tapped off at a suitable cinder notch. In about an hour the bath is nearly free from silicon and manganese, and the carbon of the pig metal is reduced about one-half. About three-quarters of the slag thus created being removed, the heat is then boiled down to a finish with small additions of ore and lime in the usual way. Blast furnace iron of the following composition is found, after the initial reaction takes place, to have the composition hereafter shown:

	Carbon.	Phosphorus.	Silicon.	Manganese.	Sulphur.
Blast furnace metal .....	4.00	0.065	0.70	0.85	0.06
After reaction..	2.25	0.04	0.00	0.00	0.04

From a fixed furnace of 40 tons capacity 17 heats per week are produced, or a period of eight or nine hours per heat is required, being a total of 690 tons per week. The average yield, or gain in steel over pig metal charged, is 102 per cent. It is claimed to be desirable to work the metal at as low a temperature as it will slag properly to facilitate the removal of the phosphorus. When the temperature is high the phosphorus clings to the metal and boils out slowly with the carbon, whereas at a lower temperature phosphorus leaves before the carbon. In a 40-ton furnace the usual preliminary charge is 67,000 pounds of limestone, with about 24,000 pounds of hematite ore, or a portion of its equivalent in mill scale. These are heated for an hour and a half, until the ore is nearly fused. About 88,000 pounds of liquid metal are then charged. The boil or reaction occurs at once and the impure slag is drawn off within an hour, and a small charge of ore and lime is then added and the metal finished in the usual way.

#### The United States Realty & Construction Company.

—A new company have been formed under the title of the United States Realty & Construction Company, with \$66,000,000 of capital stock, half of which is 6 per cent. cumulative preferred, to take over all the real estate, contracts and other property of the George A. Fuller Company; all the real estate and other assets of the Alliance Realty Company and the New York Realty Corporations, also the real estate interests of the Central Realty, Bond & Trust Company. Each 100 shares of old stock will be exchanged as follows: Fuller preferred for 110 shares of new preferred stock and 50 shares of common; Fuller common for 45 shares of new preferred and 75 of common; Alliance for 125 shares of new preferred and 110 shares of new common. The real estate interests of the Central Realty, Bond & Trust Company will be paid for in preferred and common stock. The new company, whose entire stock is to be issued forthwith, will conduct building operations in all parts of the country, and will have, it is stated, \$11,000,000 of working capital. Their directors, it is reported, will be: Executive Committee: James Stillman, Charles M. Schwab, Harry S. Black, Albert Flake, Robert E. Dowling, Henry Morgenthau, Hugh J. Grant. Other directors: James H. Hyde, William H. McIntyre, James Speyer, Charles Steele, A. D. Juilliard, G. G. Haven, Bradish Johnson, Charles H. Tweed, John J. Mitchell, Henry Budge, Geo. C. Clarke, S. P. McConnell, B. Aymar Sands, Charles Francis Adams 2d and Henry L. Higginson. The Central Realty, Bond & Trust Company will hereafter confine themselves to financial operations, and will increase their capital stock from \$1,000,000 to \$2,000,000 and their surplus from \$3,000,000 to \$8,000,000, by sale of 10,000 new \$100 shares at \$600 a share; they will act as financial agents for the construction company.

### Our Imports and Exports of Iron and Steel.

The June report of the Bureau of Statistics makes it possible to present the following figures on the imports of iron and steel during the first half of the current year, as compared with the corresponding period of 1901. The following table deals with those articles only for which the Bureau of Statistics furnishes data on the weights:

#### Imports of Iron and Steel.—Gross Tons.

	Six months ending June,	
Iron and steel and manufactures of.	1901.	1902.
Pig iron.....	19,576	115,607
Scrap iron and steel fit only to be manufactured.....	6,888	35,946
Bar iron.....	7,175	8,665
Bars, railway, of iron or steel, or in part steel.....	610	13,722
Hoop, band and scroll.....	207	2,465
Ingots, blooms, billets, &c., n.e.s.....	3,808	86,031
Sheet, plate and taggers, iron or steel.....	1,231	3,651
Tin plates, terne plates and taggers, tin.....	25,083	36,525
Wire rods.....	8,419	8,705
Wire and articles made from.....	1,817	2,186
Totals.....	74,814	313,503

These figures do not, of course, reflect the magnitude of the movement, because comparatively little foreign iron and steel was brought in during the first quarter of the year. The June statistics presented below show what proportions the imports have more recently attained:

#### Imports of Iron and Steel.—Gross Tons.

	June,	
Iron and steel and manufactures of.	1901.	1902.
Pig iron.....	6,113	32,458
Scraps and old, fit only to be manufactured.....	1,964	12,760
Bar iron.....	2,026	976
Bars, railway, of iron or steel or in part steel.....	110	5,931
Hoop, band or scroll.....	142	1,541
Ingots, blooms, billets, &c., n.e.s.....	746	35,588
Sheet, plate and taggers, iron or steel.....	520	799
Tin plates, terne plates and taggers, tin.....	3,650	5,817
Wire rods.....	1,931	2,361
Wire and articles made from.....	254	295
Totals.....	17,456	98,526

It is a pity that the Treasury does not segregate from the general total of "all other manufactures" the figures relating to the imports of structural shapes, which, we know in a general way, have become quite important.

The importations during June of manufactures of iron and steel not enumerated above were: Anvils, \$1317; chains, \$3698; cutlery, \$136,171; files, \$6893; fire arms, \$120,157; needles, \$35,780; machinery, \$412,763; shotgun barrels, \$25,326, and "all other manufactures," \$334,160. The total value of the imported iron and steel during June, 1902, was \$3,635,930, as compared with \$1,465,793 during the corresponding month in 1901. During the fiscal years ending June 30, 1902 and 1901, respectively, the value of the total iron imports was \$27,180,255 and \$17,874,789.

The export movement is exhibited in the following table:

#### Exports of Iron and Steel.—Gross Tons.

	June,	
Iron and steel and manufactures of.	1901.	1902.
Pig iron.....	2,616	2,085
Scrap and old, fit only for manufacture.....	969	799
Bar iron.....	1,094	5,623
Bars or rods of steel:		
Wire rods.....	100	1,487
All other.....	848	569
Billets, ingots and blooms.....	206	106
Hoops, band and scroll.....	60	176
Steel rails.....	31,515	7,507
Sheets and plates:		
Iron.....	412	269
Steel.....	1,569	1,850
Tin plates, terne plates and taggers, tin.....	11	256
Structural iron and steel.....	4,599	1,784
Wire.....	6,496	8,961

For the first six months the figures are as follows:

#### Exports of Iron and Steel.—Gross Tons.

	Six months ending June 30,	
Iron and steel and manufactures of.	1901.	1902.
Pig iron.....	43,125	16,740
Scrap and old, fit only for manufacture.....	6,387	5,674
Bar iron.....	13,823	16,233
Bars or rods of steel:		
Wire rods.....	3,050	8,526
All other.....	17,093	5,277
Billets, ingots and blooms.....	26,550	934
Hoops, band and scroll.....	929	1,148
Steel rails.....	199,902	48,563

#### Sheets and plates:

Iron.....	4,435	1,895
Steel.....	19,082	7,903
Tin plates, terne plates and taggers, tin.....	399	1,035
Structural iron and steel.....	29,682	36,817
Wire.....	40,491	51,881
Totals.....	404,948	202,626

We shall take occasion to refer to the machinery exports at a future date.

**The Glasgow Pig Iron Warrant Market.**—In a recent issue the London *Economist* says: "Speculation on the Glasgow pig iron warrant market has not been at so low an ebb for years as it is now and has been for some months past. For days on end many members of the once famous 'ring' never exchange a warrant, and how they all 'manage' passes the wit of the ordinary business man. It has occurred, however, to some firms that matters might be mended were Scotch and Cleveland irons made interchangeable on a basis of value. That is to say, it is recommended that a seller of Scotch should be free, of his own option, to deliver Cleveland, the difference in price being duly accounted for; in the same way Scotch could be given for Cleveland. It is also proposed that the warrants should have a 100-ton denomination instead of a 500-ton, as is the case just now. It is pretended that the object is to aid legitimate dealing, but that is all humbug. The iron ring never did and never will consider the wants or wishes of legitimate consumers, who, if consulted to-morrow, would vote for the abolition of the derelict combination. The aim of the proposal, which is not new, and which emanates at this time from the London Metal Exchange, is to, if possible, enlarge the scope of speculation. A lower denomination of warrants would accommodate, not the legitimate consumer, but a class of speculators who cannot face the present 500-ton warrant. Whether the change would raise the status of the 'ring' is a moot point. Nothing has been decided, and it will probably be months before the matter is voted upon."

**The Pressed Steel Car Litigation.**—At Pittsburgh last week an affidavit of defense was filed in the suit of the Pressed Steel Car Company against John M. Hanson, C. S. Culverhouse, William Biennan and the Standard Steel Car Company, an action to recover possession of blue prints and drafts used in the manufacture of cars. It was averred that Hanson, who was formerly chief engineer for the plaintiffs, had unlawfully removed them from their works. The defendants deny the statement of the plaintiffs in that they were largely engaged in the manufacture of structural cars, or parts thereof, and claim that this work is an insignificant part of their business, which, the defendants aver, is the manufacture of pressed steel cars. It is denied that the blue prints and drawings are of great value, as alleged by the plaintiffs. It is alleged that any one familiar with the construction of cars can easily make the drawings without the aid of drawings in dispute, and the defendants also claim that the plaintiffs have been in the habit of distributing blue prints to customers as an advertisement. Hanson says that he did not remove the blue prints or drawings from the office of the plaintiffs, neither were they removed for him, and that he knows nothing about them.

A press dispatch states that the tin plate plant of the American Tin Plate Company, at Sharon, Pa., is to be removed to Columbus, Ohio. This is incorrect, for the reason that the American Tin Plate Company do not have a tin plate plant at Sharon, the mills at that place being owned by the Sharon Tin Plate Company, an affiliated interest of the Sharon Steel Company. We can state officially that the Sharon Tin Plate Company have no intention of removing their plant from Sharon to Columbus, or any other place. Ten mills have been in operation at these works for a long time, and ten more mills, which have been under construction for about a year, are nearly completed and will probably be started this month. The entire output of the Sharon Tin Plate Company is taken under a contract by the American Tin Plate Company at regular market prices, less a discount of 2 per cent. for cash.



## PERSONAL.

John J. Utech, private secretary to Superintendent A. R. Hunt of the Duquesne mills of the Carnegie Steel Company, has resigned to accept a similar position under Joseph E. Schwab, who was recently elected president of the American Steel Foundries.

Press dispatches from Duluth, Minn., state that W. J. Olcott, who has been superintendent of Mesabe range mines for the United States Steel Corporation, has been made manager of mines for the corporation, his new duties covering all ranges. L. W. Howell has been made assistant to the president of the mining companies of the corporation. W. A. McGonagle has been made general manager for the Duluth, Mesaba and Northern, all with offices at Duluth.

Henry C. Frick of Pittsburgh has been elected a director in the Chicago, Rock Island & Pacific Railroad.

Francis L. Potts, who has long served on the Board of Directors of the Fourth Street National Bank of Philadelphia, has been elected first vice-president of that institution.

Abram S. Hewitt celebrated his eightieth birthday July 31. He is spending the summer at Bar Harbor, Maine. The New York Times for July 31 devoted a great deal of space to an interview with the venerable statesman, philanthropist and manufacturer, who gave his opinions on many subjects with a grace of expression, power of analysis and clearness of perception showing that his mind has lost none of its remarkable vigor, while the cheerful view taken of existing conditions indicates a serenity of temper most charming in one of such varied experience.

Some changes have been made in the inspection bureaus of the United States Government at the Homestead Steel Works of the Carnegie Steel Company. Charles H. Davis, formerly civil engineer of the Baltimore & Ohio Railroad, has been appointed assistant chief inspector of hull material. George F. Stevenson has been made his assistant. Joseph C. Wickersham of Steelton, Pa., has been added to the corps of inspectors at the Upper and Lower Union mills of the Carnegie Steel Company in Pittsburgh. The Government now maintains three bureaus at the mills—ordnance, construction and repairing, and bureau of steam engineering.

Andrew Wheeler, Jr., of Morris, Wheeler & Co. of Philadelphia, sails for Europe this week on the "K. Luise." Mr. Wheeler expects to return about the latter end of September.

J. Sanford Brown, who has been connected with the Carpenter Steel Company of Reading and New York for many years, has resigned. Mr. Brown, who had been associated with the management of the New York Realty & Trust Company from their inception and has been its vice-president and treasurer during nearly all that period, has now decided to devote his entire time to the interests of the realty company as secretary and treasurer.

W. P. Tyler, president of the Tyler Tube & Pipe Company, Washington, Pa., has returned from Europe.

W. C. Reilly, auditor and acting superintendent of the Youngstown Iron, Sheet & Tube Company, at Youngstown, Ohio, has been made general superintendent of the plant.

Julian Kennedy, the Pittsburgh consulting engineer, formerly general superintendent of the Carnegie Steel Company's Homestead works, and Axel Sahlin, now manager of the blast furnaces of the Millom and Askham Iron Company, in Cumberland, England, recently of the Maryland Steel Company, and late special commissioner of the British Iron Trades' Association, deputed to inquire into and report on American methods in the manufacture of iron and steel, have arranged to form a partnership for the purpose of acting in a consulting capacity for the construction of British iron and steel plants on American lines. The style of the new firm will be Julian Kennedy, Sahlin & Co., Limited. Offices have been taken in the Westinghouse Building, 2

Norfolk street, Strand, London, W. C. Some contracts are said to have already been closed for the remodeling of large English works.

## MANUFACTURING.

### Iron and Steel

The E. Keeler Company, Williamsport, Pa., were awarded a contract aggregating a half million dollars for 48-inch riveted steel pressure pipe for the White Mountain Paper Company. This pipe will run from Portsmouth, N. H., to Berwick, Maine, a distance of about 12 miles, and a half mile of it will be 50 feet under the river.

We are advised that no improvements are under contemplation at the present time at the Falcon Works of the American Sheet Steel Company, Niles, Ohio. This plant is now idle, with no prospects of early resumption.

The Iroquois Iron Company, South Chicago, have recently installed new boilers, thus giving them additional steam capacity, through which they will be enabled to produce 500, instead of 435 tons of pig iron per day. Through recent heavy sales the company's output is already under contract up to April, 1903.

The Wabash Bridge & Iron Works of Wabash, Ind., are reported to have increased their capital from \$60,000 to \$100,000.

The Indiana Rolling Mill Company, New Castle, have been incorporated with a capital of \$300,000. The directors are Chas. W. Mouch, David Kinsey, Fred P. Maus, Chas. S. Bernley and Eugene M. Bundy. It is expected to have the mill in operation by December.

The American Iron Company of Los Angeles, Cal., have been incorporated with a capital of \$75,000. The directors are J. D. Rivard, C. J. Rohde, W. H. McGruder, J. W. Sharp and H. E. Sweetser.

The Cuyahoga Steel & Iron Specialty Company of Cuyahoga Falls, Ohio, have increased their capital stock from \$75,000 to \$200,000. As previously announced in these columns, they are about to erect an open hearth furnace for the production of their own billets.

### General Machinery.

Nelman & Stokes, Reading, Pa., founders, are in the market for a vertical 40 to 50 horse-power boiler, horizontal 25 to 40 horse-power engine, 10-ton cupola, three emery wheel stands, five small horizontal drilling machines, three vertical drilling machines, 12 churns, one sand blast, 75 feet of 1½-inch shafting, belting, pulleys, &c. The firm intend to erect a new foundry, 75 x 110 feet, with boiler and engine house, in Hamburg, where their new partner, Thomas L. Smith, lives. As soon as the plant is ready for operations, which is expected to be by September, the building of Mr. Smith will be used as a machine shop, storage house and offices.

In the course of a few months the Giddings & Lewis Mfg. Company of Fond du Lac, Wis., will be in the market for some new machinery. The company have purchased property adjoining their plant upon which they will construct an erecting shop. The foundry and machine shop will also be completely remodeled.

The Globe Machine & Stamping Company, 970-972 Hamilton street, Cleveland, Ohio, have during the past month increased their capacity considerably by the installation of a number of new tools, including a Fostlek & Holloway radial drill, a Pond planer, a Reed lathe with taper attachment, a Knecht sensitive drill press, a Steptoe shaper and a Le Blond universal milling machine with vertical attachment. They report on hand as many orders as they can take care of, among which are a number for drop forging dies and punching and forming dies for sheet metal work. Fred. G. Nicalous, formerly with the Browling Engineering Company and later with the National Stove & Illuminating Company, has interested himself with the Globe Machine & Stamping Company and is now their superintendent.

The old established firm of J. J. Gerrish & Co., railroad, steamship and mill supply dealers at Portland, Maine, are now controlled by D. F. Corser, who is president of the company. Mr. Corser was formerly connected with the Grand Trunk Railway system and is treasurer of the Indian Spring Woolen Company of Madison.

The Marinette Iron Works, Marinette, Wis., report that they have had no strike, that the machinists merely made a demand upon them for shorter hours and increase of wages. They finally compromised by granting them a 55-hour week, with no increase in pay, on account of having advanced most of their machinists from 10 to 25 per cent. during the past two years, and are now paying them as high wages as any of their competitors.

The Minneapolis Threshing Machine Company, Minneapolis, are making preparations to erect a number of buildings under the direction of their own architects and engineers. The plant will cost in the neighborhood of \$75,000 and will give employment to about 60 men. In addition to the factory buildings, contracts have been let for ten dwellings to be disposed of to employees. In addition to threshing machines the company will manufacture boilers, sheet iron and sheet steel for elevator mill work. R. D. Wood & Co. have been awarded the contract for hydraulic machinery.



Bertsch & Co., Cambridge City, Ind., manufacturers of shears, punches and bending rolls, report business the best in the history of the firm, with enough orders ahead to keep them running for several months. They have just shipped a 102-inch improved hydraulic plate shears weighing 50 tons, for 1½-inch plates, to the Lukens Iron & Steel Company, Coatesville, Pa.

J. E. Simons, who until recently was superintendent of rolling stock and machinery of the Pittsburgh Coal Company, has been elected treasurer and general manager of the Hunt Foundry & Machine Company, a reorganization of the Hunt Air Brake Company of New Kensington, Pa. The new company have been organized under a New Jersey charter with a capital of \$100,000. Their plant at New Kensington is to be greatly improved, one of the additions to be a foundry. The products will be largely ice machines and the Hunt air brake, a braking device for street cars. The officers of the company are: E. A. F. Ahlbert, president; H. C. Hunt, vice-president; J. E. Simons, treasurer and general manager; S. H. Heath, secretary. Messrs. Simons, Ahlbert, Hunt and George H. Clapp constitute the directorate.

The Connersville Blower Company, Connersville, Ind., contemplate the erection of a substantial addition to their plant.

The Hocking Valley Railway Company will make important improvements to their shops at Columbus. A building 100 x 200 feet will be erected for a boiler shop. The present boiler shop will be converted into an addition to the machine shop. Considerable new machinery is being added.

The Akron Electrical Mfg. Company of Akron, Ohio, are planning to erect a large addition this fall. The building erected last spring proved inadequate to their increasing business. They manufacture motors and dynamos and are going into the production of machines of larger size than heretofore.

The following are a few of the orders recently received by the Buffalo Forge Company, Buffalo, N. Y., through their different branch houses: Two 70-inch steel plate steam fans, for heating and ventilating, direct connected to two Buffalo Forge Company engines, and one 130-inch ¾ housing standard steel plate pulley fan for mechanical draft, to be shipped to Copenhagen, Denmark; one induced draft plant and one 23 horse-power engine for an electric light plant in Dutch Gulana, South America; five Buffalo engines of 45 horse-power each, for driving generators, and one 38 horse-power engine for the pumping equipment to be installed in a sugar factory now being built near Manzanillo on the south side of Cuba; one 20 horse-power Buffalo vertical class "A" engine, to be shipped to Gustenunde, Germany; one 15 horse-power double vertical single acting Buffalo engine, to Gothenburg, Sweden; one 60-inch standard steel plate fan for ventilation, to be shipped near Glasgow, Scotland; one 140-inch steel plate fan with heaters complete, for heating and ventilation, to Barrow-in-Furness, England; one standard 80-inch fan and heater complete and one 90-inch pulley fan, for ventilation, and one 30 horse-power horizontal Buffalo engine, to London, England; one 120-inch fan and six 60-inch fans to Manchester, England; one 80-inch standard steel plate fan, for mechanical draft, to Victoria, British Columbia; one 110-inch steel plate pulley fan direct connected to a cylinder above shaft Buffalo engine, for mechanical draft, to Halifax, N. S.; one 70-inch fan and one 100-inch fan, for heating and ventilating purposes, to Portland, Ore.; one standard 40-inch steel plate fan, to College Station, Texas; one 100-inch steel plate fan direct connected to a Buffalo single vertical engine, to San Francisco, Cal.; two special 60-inch steel plate fans, to New Orleans, La., and one 25 horse-power horizontal Buffalo engine, to Gretna, La.

The Minneapolis Steel & Machine Company of Minneapolis, Minn., is the name of the company recently organized with a capital stock of \$500,000, from the merging of the following three companies: Barrett & Record Company, the Twin City Iron Company and Gillette-Herzog Mfg. Company.

#### Boilers, Engines, &c.

The William Flemming Sons Boiler Company of New Castle, Pa., have secured a contract for ten large stacks for a new power plant at McKee's Rocks, Pa. Each stack will be 130 feet high and 10 feet in diameter.

The Jackson Street Railway Company, Jackson, Ga., will build a power plant on the Ocmulgee River, about 7 miles away, to supply that city with electricity for lighting and power for their proposed new railway system. W. F. Smith, general manager, advises us that no contracts for equipment will be let for some time, as it will take until next winter to develop the water power.

The Alamo Mfg. Company, Hillsdale, Mich., builders of Alamo gas engines, have increased their capital stock from \$25,000 to \$75,000 to enable them to extend the business and enlarge the plant. To this end the company will immediately erect a new brick machine shop, 40 x 208 feet, plans for which have already been approved, which, with the nearly completed brick foundry, 40 x 120 feet, will give them double the present capacity. At the recent annual meeting the following officers and directors were elected: A. D. Stock, president; Dr. W. H. Sawyer, vice-president; C. H. Rittenhouse, secretary; E. T. Prideaux, treasurer; F. M. Stewart and Jacob Scowden.

For the Susquehanna Iron & Steel Company's new plant at Columbia, Pa., the Pittsburgh Gage & Supply Company, Pittsburgh, Pa., will furnish three 250 horse-power water tube boilers.

They have recently closed contracts with the National Steel Company to furnish a complete White Star filtering system for a vertical cross compound blowing engine, also filtering systems for the electric department of the Carnegie Steel Company, Homestead Works, and the Wheeling Steel & Iron Company, Wheeling, W. Va.

The H. N. Strait Mfg. Company, Kansas City, Kan., have about completed their new plant for the building of Corliss engines, and expect to get it started within the next two weeks. The equipment, including an electric traveling crane of 40 feet span and 25 tons lift, is modern throughout, operated by electricity, and was furnished, except the engine, by the American Tool Works Company, Cincinnati, Ohio; New Haven Mfg. Company, New Haven, Conn., and Bement, Miles & Co., Philadelphia. The engine, an 18 x 42 Corliss, they built themselves, and it is stated that this is the first stationary steam engine ever built in Kansas City.

The Buehler Machine Company of St. Marys, Ohio, have taken a contract from the Heislner Mfg. Company for 23 high duty boiler feed pumps. They have recently commenced the manufacture of 20 triple expansion pumping engines for the same people, and the two contracts will furnish them work for nearly three months. They will enlarge the factory to take care of the work.

R. B. Heller, J. B. Augustine, L. J. Halter, Fred. Groenwold and Wm. Kern, Napoleon, Ohio, have organized a company for the manufacture of gasoline engines. They will build a factory in that town.

#### Fires.

The hog abattoir of the Central Stock Yards Company, Jersey City, N. J., situated on the Kearny meadows, was destroyed by fire August 2, entailing a loss of over \$100,000. A large amount of machinery was destroyed.

Fire on August 5 destroyed the boiler and engine house, two power houses, tipples and a half mile of tramway at the Peerless mine in Aguilar, owned by the Northern Coal & Coke Company, Denver, Col. The loss is about \$100,000.

#### Foundries.

The Ferris Clevis Company, Oshkosh, Wis., have reorganized with a capital stock of \$30,000 and will immediately proceed with the erection of a plant, to consist of a foundry, 80 x 100 feet, and annealing room, 80 feet square, for the manufacture of the Ferris patent clevis and other malleable iron products. The officers are Dr. W. B. Thewalt, president; W. E. Smith, vice-president; D. L. James, treasurer, and R. T. Schuttler, secretary. The officers with John Rosenkranz form the board of directors.

The Illinois Iron Company, Rock Island, have been incorporated with a capital of \$2500 to manufacture agricultural implements, castings and forgings. The incorporators are L. J. S. Green, T. A. Murphy and L. G. Susenmihl.

The Marion Gray Iron Foundry Company, Marion, Ind., have incorporated under the same name with a capital stock of \$10,000, and are doubling their capacity. The company are in the market for a 72-inch shell cupola and a No. 6 or 7 positive blower. M. F. Gartland is secretary.

The Columbus Malleable Iron Company, Curtis and Lexington avenues, Columbus, Ohio, are now rebuilding their plant, which was destroyed by fire early this year, upon a scale that will provide more than three times their former capacity. They are installing a thoroughly modern equipment and expect the new plant to be completed in about 30 days.

The Uniontown Engineering & Construction Company have been organized at Uniontown, Pa., and will erect a plant at that place for the manufacture of castings and forgings. Identified with the new company are Harry L. Burnham of New Castle, Pa.; George E. Sperling of Pittsburgh, and Oscar Emrich of Cleveland, Ohio.

Application for a Pennsylvania charter will be made August 21 by the Coshocton Iron Company, operating a foundry at Coshocton, Ohio, which have become allied with the Liggett Spring & Axle Company of Allegheny. The incorporators are C. E. M. Champ, William E. Marquis and S. E. Hare, all of the Liggett Company. The company will remove their works to a building 100 x 300 feet, which will be erected to adjoin the large plant which the Liggett Company are building on the P. McK. & Y. Railroad, opposite Monongahela City, Pa. The chief product of the foundry will be axle boxes, of which the Liggett Company use about 100 tons per month.

The recently organized Central Malleable Iron Company, Decatur, Ill., will acquire the plant and business of the Sattley Mfg. Company, manufacturers of malleable and gray iron castings. The new company intend to enlarge the capacity by the building of additional furnaces and new buildings. The incorporators are S. E. Prather, Logan Hay and H. M. Merrim of Springfield, Ill., and George A. Hackett, John P. Utt and T. J. Arnett of Decatur.

The directors of the United States Pump & Supply Company, Toledo, Ohio, met last week and appointed a committee to take immediate action toward building a plant. The factory will be located on Industrial Heights, in Toledo, and among other buildings a large foundry will be erected. George W. Pomeroy is chairman of the building committee.

### The National Steel Refining Company.

The National Steel Refining Company, 312 Bullitt Building, Philadelphia, Pa., incorporated with a capital stock of \$1,500,000, and who recently purchased a plant at Carnegie, near Pittsburgh, now have in operation five steam hammers, the largest of which is 6000 pounds. They are erecting in a separate building a 10-inch rolling mill, lately purchased from a company near Lynchburg, Va., which they expect to be able to start up about the middle of September. The mill is practically a new one, it having been in operation only a few months. There are also on the property about 10 crucible furnaces.

The company produce Damascus steel for dies, punches, chisels and all purposes where a high grade tool steel is required, which they claim has the advantage of being fibrous in its nature. It is produced in heats of 15 tons at a time and is entirely homogeneous. Another product of the company is an air hardening steel of a superior quality.

The officers are John W. Woodside, president; B. K. Jamison, vice-president; Frank M. Wirgman, secretary, and George D. Woodside, treasurer. A. A. Du Ban & Co. are the auditors. George F. Harrison, Bourse Building, Philadelphia, is general sales agent, and the Ely & Williams Company, 257 Broadway, are their New York representatives.

The American Nickel Steel Company, with the same amount of capital and officered by the same gentlemen as the National Steel Refining Company, to which company they are closely allied, but whose stock is held principally in England and France, own and control four patents for the use of nickel as an alloy with iron and steel.

The American Nickel Steel Company expect to derive their income from those who would take up the traffic of nickel steel on royalty, they having already granted licenses to the United States Government and the Carnegie Steel Company. They are, however, making nickel steel under their new alloy for manufacture of piano wire, pocket knives, cutlery, surgical, optical and mathematical instruments, saddlery, hardware, &c., to take the place of metal they are now using, which is nickel plated. It has a fine color with a polish equal to nickel plate, is noncorrosive and can be worked with hot forging or cold rolling.

The Nickel Steel & Forging Company, Pittsburgh, are merely an operating company for both the National Steel Refining and the American Nickel Steel companies and are owned by the former company.

### American Union Electric Company.

Under the style of the American Union Electric Company, eight electrical supply companies were consolidated. The new company are capitalized at \$7,000,000, of which \$5,000,000 has been issued. The company will have headquarters at 15 Cortlandt street, New York, the management to be under the direction of Elmer Morris, S. M. Young, E. P. Ewing and J. Fountain. The constituent companies are: Union Railway Power & Electric Company, New York; Morris Electric Company, East Orange, N. J.; Falcon Electric Mfg. Company, New York; Electric Motor & Specialty Company, New York; Fountain Mfg. Company, New York; Federal Paper Company, Derby, Conn.; Refrigerating Machine Company, New York; Metropolitan Switch Board Company, New York.

With the exception of that of the Metropolitan Switch Board Company all of the plants are to be consolidated with that of the Morris Electric Company, at East Orange. The Union Railway Power & Electric Company are simply a sales company.

**American Steel Hoop Company Scale.**—Last week a convention was held in Pittsburgh between the officials of the Amalgamated Association and the American Steel Hoop Company, at which the wage scale governing mills of the American Steel Hoop Company was discussed. The only contention over the scale was in regard to the

eight-hour clause in the memorandum of agreement and to which the officials of the American Steel Hoop Company seriously objected, claiming that an eight-hour turn in their finishing mills was not feasible at this time. After considerable discussion over the matter it was decided to allow it to rest and it would be arranged at some future time between the national officers of the Amalgamated Association and the representatives of the American Steel Hoop Company. It is the same in every way as the scale governing the mills of the Republic Iron & Steel Company and others making similar products.

**The James E. Thomas Company.**—(By Telegraph.)—PITTSBURGH, PA., August 6, 1902.—It is possible the plant of the James E. Thomas Company, at Newark, Ohio, manufacturers of ingot molds, may be removed to the Pittsburgh district. This company are members of the American Ingot Mold Company of Pittsburgh, but are unable to turn out their allotment of ingot molds owing to the fact that their plant is so small. It has been proposed therefore to either build a large plant in Pittsburgh for the exclusive manufacture of ingot molds or else very much enlarge the present works at Newark. A definite decision in the matter will be arrived at within a short time.

**The Tin Plate Vote.**—(By Telegraph.)—PITTSBURGH, PA., August 6, 1902.—Voting is still going on among the lodges of the Amalgamated Association on the question of accepting a reduction in wages to permit the American Tin Plate Company to secure the business of the Standard Oil Company. Theodore J. Shaffer is visiting the principal plants of the American Tin Plate Company, and trying to induce the men to accept the proposed cut. However, the vote thus far indicates that the proposition will be defeated.

J. P. O'Donnell, the head of the International Pneumatic Tool Company of London, England, is in America arranging the final details of the transfer of that company to the Chicago Pneumatic Tool Company. Taking over this company gives the Chicago Pneumatic Tool Company control of the pneumatic tool trade throughout Europe. They will now consolidate the factory of the newly acquired company with their plant already started in London, and are sending men from their staff in America to take charge of the office and factories there. J. W. Duntley, president of the company, will sail for London August 12 to arrange matters to push the trade in Great Britain and on the Continent. At the present time they have a force of experts in Glasgow giving an exhibition of ship riveting and ship construction with pneumatic tools under the auspices of the Glasgow Federation of Ship Builders. There they are just waking up to the necessity of the use of pneumatic tools to enable them to compete with the American ship builders. The Chicago Pneumatic Tool Company have been compelled to operate two of their plants in America extra time, at night, and the addition to their London plant will give them a needed increase in manufacturing facilities.

For some time the American Tin Plate Company have had under construction at their Monongahela Works, South Side, Pittsburgh, some machinery for the rolling of black plate under an entirely new process. The details of this process have not been made public, but it is said that if it proves to be as successful as anticipated it will completely revolutionize present methods of manufacture of tin plate, particularly as regards the black plate rolling. Under the present Amalgamated scale the cost of rolling black plate is about \$12 a ton, and it is the aim of this new process to very considerably reduce this admittedly excessive cost. The new machinery is expected to be finished in September, when the rolling of black plate will be commenced. If the process is successful it is the intention of the American Tin Plate Company to equip their principal plants with the improved machinery.



## The Iron and Metal Trades.

There have been very few developments during the week to indicate any notable changes in the Iron markets of the country. From all the distributing centers come reports of further purchases of Foundry Pig Iron for delivery during the first quarter and the first half of 1903. Chicago notes sales aggregating about 85,000 tons, chiefly of Northern brands. Among them was one lot of 30,000 tons. Cincinnati notes that the volume of transactions was not quite so great as that of former weeks. Some Southern makers are still selling for the first quarter of 1903 on the basis of \$17 for No. 2 at Birmingham, but the majority are asking \$17.50 and \$18. In all these transactions the buyers take the risk of any changes in freight rates. Along the seaboard a good deal of Scotch Iron is selling at \$20 to \$22, ex-ship, on importation orders. Spot lots command more money.

The foreign Steel markets are reported to be easier, in sympathy with the lower tendency developing with us, and Billets can now be laid down in Pittsburgh at about \$30.50. Some consumers having overbought are reselling to a moderate degree. The volume of business doing is small, however.

While not officially confirmed it is probable that an order for close to 30,000 tons of Steel Rails, for delivery to the Pacific Coast, has gone to a German Rail maker. It is understood that the Southern Pacific and Union Pacific companies together needed 100,000 tons, but that the American mills were unable to meet the requirements as to deliveries on all the work, so that a part of it had to be placed abroad.

The reports concerning the condition of the heavy trades continue very satisfactory. There is a continued flow of good orders for Structural Material from different parts of the country, and the Plate makers generally are enjoying a rush of work.

Less satisfactory accounts come from the lighter lines. The volume of business in Bars has fallen off and there is more hunting for work. The same is true of Hoops and Bands, and there has been no improvement recently in the Sheet trade. Skelp is dull and weaker. Quite a number of the mills are taking advantage of these circumstances to close down for summer repairs and in order to afford their crews an opportunity for a rest. In many cases the men have been under tremendous pressure for over a year and have petitioned for a vacation themselves.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one month and one year previous.

Aug. 6, July 30, July 9, Aug. 7,  
1902. 1902. 1902. 1901.

### PIG IRON:

Foundry Pig No. 2, Standard, Philadelphia .....	*\$22.00	\$22.00	\$22.75	\$14.75
Foundry Pig No. 2, Southern, Cincinnati .....	*19.75	20.75	20.75	13.00
Foundry Pig No. 2, Local, Chicago	21.00	21.00	21.00	15.00
Bessemer Pig, Pittsburgh .....	21.75	21.75	21.25	15.75
Gray Forge, Pittsburgh .....	20.50	21.00	21.00	13.75
Lake Superior Charcoal, Chicago	25.00	25.50	25.00	17.00

### BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh .....	31.00	32.00	31.25	24.50
Steel Billets, Philadelphia .....	28.75	28.75	29.50	25.50
Steel Billets, Chicago .....	31.00	31.00	....	....
Wire Rods, Pittsburgh .....	36.00	36.00	36.00	36.00
Steel Rails, Heavy, Eastern Mill.	28.00	28.00	28.00	28.00
Spikes, Tidewater .....	2.00	2.00	2.00	1.80
Splice Bars, Tidewater .....	1.90	1.90	1.90	1.50

### OLD MATERIAL:

O. Steel Rails, Chicago .....	18.50	18.50	18.50	13.00
O. Steel Rails, Philadelphia .....	21.50	21.25	21.00	15.75
O. Iron Rails, Chicago .....	24.50	24.50	24.00	19.00
O. Iron Rails, Philadelphia .....	24.00	24.50	25.00	19.00
O. Car Wheels, Chicago .....	21.00	21.00	21.00	16.50
O. Car Wheels, Philadelphia .....	20.00	21.00	20.50	16.50
Heavy Steel Scrap, Chicago .....	18.50	19.00	19.00	12.00

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.	1.95	1.95	1.95	1.55
Common Iron Bars, Chicago .....	1.80	1.90	1.75	1.60
Common Iron Bars, Pittsburgh ..	1.80	1.80	1.75	1.45
Steel Bars, Tidewater .....	2.00	2.00	1.95	1.60
Steel Bars, Pittsburgh .....	1.60	1.60	1.60	1.40
Tank Plates, Tidewater .....	2.00	2.00	2.00	1.75
Tank Plates, Pittsburgh .....	1.75	1.75	1.75	1.60
Beams, Tidewater .....	2.00	2.25	2.25	1.75
Beams, Pittsburgh .....	2.00	2.00	1.60	1.60
Angles, Tidewater .....	2.25	2.25	2.25	1.75
Angles, Pittsburgh .....	2.00	2.00	1.60	1.60
Skelp, Grooved Iron, Pittsburgh.	2.10	2.10	2.10	1.90
Skelp, Sheared Iron, Pittsburgh.	2.15	2.15	2.15	2.00
Sheets, No. 27, Pittsburgh .....	2.90	2.90	2.90	3.50
Barb Wire, f.o.b. Pittsburgh .....	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh .....	2.05	2.05	2.05	2.30
Cut Nails, Mill .....	2.05	2.05	2.05	2.00

### METALS:

Copper, New York .....	11.75	11.75	12.00	16.50
Spelter, St. Louis .....	5.20	5.05	4.90	....
Lead, New York .....	4.10	4.10	4.10	4.37½
Lead, St. Louis .....	3.97½	3.97½	3.97½	....
Tin, New York .....	28.00	28.10	28.25	27.50
Antimony, Hallett, New York .....	8.00	8.00	8.37½	8.75
Nickel, New York .....	40.00	40.00	50.00	60.00
Tin Plate, Domestic, Bessemer.				
100 pounds, New York .....	4.19	4.19	4.19	Nom.

\* For 1903. † Official quotations.

## Chicago

FISHER BUILDING, August 6, 1902.—(By Telegraph.)

The buying movement of Pig Iron has continued to broaden and deepen, a great many small consumers coming into market during the week, especially the melters outside of the city; but large consumers also have important contracts pending, and one of about 30,000 tons was closed during the week. In the aggregate about 85,000 tons were sold for the first half of 1903 delivery, a little over half of this amount being for Northern Iron, the balance for Southern brands, on the basis of prices previously quoted. In lines of Steel there has been possibly less general activity, but important contracts continue to be let for next year's delivery. Western railroads are still purchasing Heavy Rails, the Great Western coming into the market the first of the week for 25,000 tons, and local agents of Eastern mills have booked orders aggregating 18,000 tons. There are some developments about to be disclosed in the Bar Iron situation of the Central West. The effort to steady the market by an increased price for Bar Iron has ended in failure, the artificial level, 1.35c., being utilized merely as a shield. The bulk of business during the week has been at 1.80c. to 1.85c. Competition is again keen with an increase in the number of orders taken during the week. The demand for Structural Material is still active, but the number of contracts closed during the week has been relatively small, only about 6000 tons having been contracted for next year's delivery. Foreign Steel has been conspicuous only for inactivity during the week. An interesting point in the situation is the scarcity



and continued hardening of the market for Old Material, with prices higher and still tending upward.

**Pig Iron.**—The aggregate sales of Pig Iron during the week are about 85,000 tons, 30,000 tons of which were purchased by one large concern; about three-fourths of the latter being for Northern Iron, the remainder the Southern product. The general character of the market has changed but little since last report. There are still a few large buyers in the market ready to place contracts for next year's delivery, but most of the transactions during the week were from the smaller melters; nine-tenths of the business transacted has been for next year's delivery—that is, running up to July 1. Probably about half the tonnage sold during the week was of Northern brands. The urgency for spot Iron and Iron for delivery during the last quarter of the year has met with little relief, and the stringency of the market is being admitted by consumers as well as by furnaces. Principal Northern stacks in this territory are so fully sold ahead that they are indifferent about taking orders; and, in fact, in some cases it is impossible to do so for delivery earlier than next April. Sales of spot Iron have been made in carload lots aggregating possibly 1000 tons of Southern brands, on the basis of \$25.65 for No. 2 and \$26.15 for No. 1 Foundry, Chicago. Twenty-five hundred tons of Northern No. 2 Foundry have sold at \$25 and 200 tons of special Southern brands at \$24.50 for October, November and December, 1902. Among the individual sales of Northern Iron may be mentioned one lot of 10,000 tons, two lots of 5000 tons each, one lot of 4000 tons and 22,000 tons in lots ranging from 1000 to 4000 tons. Nearly all of this was strong Foundry Iron, but was sold rather on analysis than by grade. Prices obtained were within the range quoted below. Southern Iron has been sold about as follows: 12,000 tons in lots of 1000 to 4000 tons each, 4000 tons in lots of 500 to 2000 tons each, one lot of 5000, and 5000 tons in lots of 500 to 1500 tons each. Nearly all of the Southern Iron being of Foundry grades, and the majority of it No. 2. Silvery Irons are in especially active demand, and Charcoal Iron is very scarce and wanted. The majority of the spot Iron being sold brings a premium of \$5 per ton, and Iron for the last quarter of the year a premium of about \$3 per ton over the prices current for delivery for the first half of 1903. The following are the prices current for July, 1903:

Lake Superior Charcoal.....	\$25.00 to \$26.00
Local Coke Foundry, No. 1.....	21.50 to 22.00
Local Coke Foundry, No. 2.....	21.00 to 21.50
Local Coke Foundry, No. 3.....	20.50 to 21.00
Local Scotch, No. 1.....	22.00 to 22.50
Ohio Strong Softeners, No. 1.....	24.00 to 24.50
Southern Silvery, according to Silcon.....	22.10 to 22.65
Southern Coke, No. 1.....	21.40 to 21.90
Southern Coke, No. 2.....	20.65 to 21.15
Southern Coke, No. 3.....	20.15 to 20.65
Southern Coke, No. 1 Soft.....	21.15 to 21.65
Southern Coke, No. 2 Soft.....	20.65 to 21.15
Foundry Forge.....	19.65 to 20.15
Southern Gray Forge.....	19.15 to 19.65
Southern Mottled.....	19.15 to 19.65
Southern Charcoal Softeners, according to Silcon.....	25.00 to 26.00
Alabama and Georgia Car Wheel.....	26.50 to 27.00
Malleable Bessemer.....	22.00 to 23.00
Standard Bessemer.....	23.00 to 24.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silcon.....	26.00 to 27.00

**Bars.**—The market for Bar Iron has been again unsettled. The attempt to obtain higher prices was followed by an increased demand, but consumers were unable to break the prices which had apparently been established and an increased tonnage was taken at prices ranging from 1.80c. to 1.90c., and small lots at 1.95c. The effort to steady the market has not been abandoned, however. The demand for Soft Steel Bars has been somewhat increased. The following are the prices current: Bar Iron, 1.80c. to 1.95c.; Soft Steel Bars, 1.75c. to 1.90c.; Hoops, 2.10c. to 2.25c.; Angles, 2.25c., base, mill shipments. The demand from store has continued active and the market firm. Bar Iron is selling at 2.25c., Soft Steel Bars at 2c. to 2.25c., Angles at 2.50c., and Hoops at 2.50c., base, from store.

**Structural Material.**—There has continued to be an active inquiry for Structural Material for next year's delivery, but the sales consummated have not aggregated over 5000 to 6000 tons. Among the orders are still some bridge work for Western railroads and large buildings to be erected in Chicago and neighboring cities. There has continued to be some inquiry for foreign material, but few transactions have been consummated. Domestic Steel, mill shipment, has been quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. The demand from store continues active and the market strong. Beams and Channels from local yards are quotable at 2.50c. to 3.50c., Angles at 2.50c. to 3.50c., Tees at 2.55c. to 3.50c., but premiums are often paid over these prices for special sizes wanted immediately.

**Plates.**—There seems to be no cessation in the demand for Plates, but the mills are so far sold ahead that the difficulty of obtaining deliveries is more noticeable than ever. While official prices are unchanged, there is no difficulty in

obtaining a premium of \$4 to \$5 per ton wherever it is possible to secure a nearby delivery. Official quotations remain as follows: Tank Steel, ¼-inch and heavier, 1.75c. to 2.25c.; Flange, 1.85c. to 2.35c.; Marine, 1.95c. to 2.50c. The demand from store continues urgent and full prices are readily obtained, as follows: Tank Steel, ¼-inch and heavier, 2.30c. to 2.50c.; Tank Steel, No. 8, 2.45c. to 2.55c.; Flange, 2.40c. to 2.75c., all f.o.b. warehouse, Chicago.

**Sheets.**—No new features have been developed, with the exception of Galvanized prices, which are sustained. Sheets are heavy and weak. Quotations are as follows: No. 27 Black Sheets, 3.25c., mill shipment; from Chicago, small lots from store, 3.45c. to 3.55c. Mill shipment Galvanized Sheets sell at 4.05c. to 4.15c., net, and small lots from store are sold at 4.55c. to 4.65c. for No. 27.

**Cast Pipe.**—There has been an absence of large business, but several important contracts are pending. The demand from railroads and water companies has continued quite liberal in a small way, and considerable business has been done on a basis of current prices, which are as follows: 4-inch, \$35.75; 6-inch, \$33.75; 8-inch and upward, \$33; Gas Pipe, \$1 per ton higher than Water, f.o.b. Chicago.

**Merchant Pipe.**—The market has been without special activity, but prices have been well sustained. Carloads are quoted as follows, random lengths: Black, ½ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ½ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off.

**Boiler Tubes.**—The market has remained quiet but steady. For mill shipment prices are as follows:

	Steel.	Iron.
1 to 1½ inches.....	42½	39
1½ to 2½ inches.....	55½	38
2½ to 5 inches.....	61	48
6 inches and larger.....	55½	38

There is little demand from store, but prices have remained quite steady as follows:

	Steel.	Iron.
1 to 1½ inches.....	35	35
1½ to 2½ inches.....	47½	32½
2½ to 5 inches.....	55	42½
6 inches and larger.....	47½	..

**Merchant Steel.**—It develops that large contracts, that is in the aggregate, have been placed by Canadian manufacturers of agricultural implements for Agricultural Steel during the past few weeks, about 25,000 tons having been sold by American companies for delivery running to June, 1903. In other lines the market has been quiet, but there has been a moderate order for Tool Steel and prices have been well sustained. Mill shipments are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 7c. for mill shipments; specials, 12c. upward.

**Rails and Track Supplies.**—There is no cessation in the activity of the Rail market, although actual contracts placed during the week have not been large. About 18,000 tons in three lots have been taken by local representatives of Eastern mills, and the Western railroads have placed an order for 20,000 tons with a local mill. Heavy orders have also been placed for Angle Bars and Spikes, all for delivery during the first half of 1903. In fact, some of the deliveries will extend into October, and even later. Several large orders are pending, but difficulty in making the desired delivery has thus far defeated the consummation of transaction. Official prices for Heavy Sections remain at \$28 for Standard and \$27 for second quality. Light Sections are selling rapidly whenever possible at \$32 to \$45 per ton, according to weight and time of delivery. Fastenings are quoted in carload lots as follows: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

**Billets.**—The market has changed but little, with a fair demand for small lots of domestic and some inquiry for foreign Billets, ranging from \$31 to \$32, Chicago delivery. Sales of small lots aggregating 1000 tons of foreign Billets have been made from \$32.50 to \$33 for special sizes. Domestic Open Hearth Billets are selling at \$35 to \$40, according to analysis, buyer and time of delivery.

**Old Material.**—With the exception of Heavy Melting Steel Scrap, which is in more ample supply and weak, relatively, the market for Old Material has been very strong with an active demand, resulting in higher prices for Railroad Wrought, Dealers' Forge, Busheling, Axel Turnings and Borings. Small lots of Heavy Relaying Rails have sold at \$32 to \$33. The following are the prices current per gross ton:

Old Iron Rails.....	\$24.50 to \$25.00
Old Steel Rails, mixed lengths.....	18.50 to 19.50
Old Steel Rails, long lengths.....	23.50 to 24.50
Heavy Relaying Rails.....	32.00 to 33.00
Old Car Wheels.....	21.00 to 22.00
Heavy Melting Steel Scrap.....	18.50 to 19.00
Mixed Steel.....	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates.....	\$22.50 to \$23.00
Iron Car Axles.....	25.00 to 26.00
Steel Car Axles.....	23.00 to 23.50
No. 1 Railroad Wrought.....	19.00 to 19.25
No. 2 Railroad Wrought.....	18.50 to 19.00
Shafting.....	19.00 to 20.00
No. 1 Dealers' Forge.....	17.00 to 17.50
No. 1 Busheling and Wrought Pipe.....	15.00 to 15.50
Iron Axle Turnings.....	14.50 to 15.00
Soft Steel Axle Turnings.....	14.00 to 14.50
Machine Shop Turnings.....	14.00 to 14.25
Cast Borings.....	10.00 to 10.50
Mixed Borings, &c.....	10.00 to 10.50
No. 1 BOLLERS, cut.....	14.50 to 15.00
Heavy Cast Scrap.....	15.00 to 16.00
Stove Plate and Light Cast Scrap.....	11.50 to 12.00
Railroad Malleable.....	16.25 to 16.75
Agricultural Malleable.....	..... to 15.00

**Metals.**—A decidedly firmer tone has been developed in Copper in sympathy with primary points, and the demand is increasing with an upward tendency in prices. Lake, however, continues to sell at 12½c. in car lots, and 12¼c. to 12¾c. in a jobbing way. Pig Lead has remained firm with a fair demand at 4.05c. for 50-ton lots and 4.07½c. in carload lots. Sheet Zinc is selling well, and is firm at 6.50c. in carload lots and 6.65c. in lots of 600 pounds. Old Metals have been less heavy, but with only a moderate demand. Prices are as follows: Heavy Cut Copper, 11¼c.; Red Brass, 11¼c.; Copper Bottoms, 10c.; Lead Pipe, 3.80c.; Zinc, 3½c.

**Coke.**—The little Coke obtainable for prompt delivery has been readily sold at full prices. Connellsville 72-hour Foundry Coke, as well as Virginia and West Virginia, has been sold during the week at \$6.50, but the full range of prices is \$6 to \$7 per ton, spot track, Chicago.

## Philadelphia.

FORREST BUILDING, August 5, 1902.

The situation is such that we might repeat what was said last week and still be thoroughly up to date. Good Foundry Irons are as scarce as ever, the demand is as large as ever, and prospects of easier conditions as uncertain as ever. Foreign Iron is about the only kind that can be had promptly, but somehow or other consumers seem to pull through, although they are constantly on the ragged edge and liable to be stopped short at any time. Coke is really scarcer than Pig Iron, but the shortage works both ways and cuts off consumption the same as it cuts off production. The feeling in regard to prices in the distant future is surprisingly strong considering the high range already attained, but there is really nothing upon which to base pessimistic ideas, except on the general principle that when values are abnormal it is only a question of time when a reaction will set in. It is not worth while, however, to go over the old story of conditions which may, and which sooner or later undoubtedly will, cause a reaction, but the fact of phenomenal prosperity is so evident that for the time being it overshadows everything else. Under these conditions consumers are again beginning to figure on purchases for next year's business. A considerable tonnage was entered some time ago, after which for two or three weeks there was a halt, but now buyers are again in the market. Makers are quite willing to meet the demand at present prices, on the ground that even if there should be a further advance, they will not be far astray in having order books well filled at about \$22 for No. 2 X Foundry, while in case of a decline it will help them out considerably. It is quite impossible, however, for any one to come to definite conclusions either as regards the culminating figures or the date when such culmination will be reached. Crop reports are excellent, the financial situation is sound, and, in fact, every essential element for prosperous conditions appears to be in force to a most unusual extent. It may be, however, that these have been more or less discounted. Prices of Pig Iron, Steel Billets and Old Material are just double what they were five years ago, while Coke costs nearly three times as much. With all the business that can be handled, and at prices such as mentioned, it is surely a little too much to expect still higher prices, although such may be the case temporarily. As a matter of fact, past experience is of little value in these times. Conditions are so different to any that have been met in the past, that it may not be safe to assume that what has been will be again. Present conditions are to a great extent experimental conditions; consequently it will be necessary to wait for results before coming to definite conclusions.

**Pig Iron.**—In some respects reports are less uniform than they were during the past five or six months. Some makers claim that there is more pressure to place orders for next year deliveries than there has been at any previous time; others report quite the reverse. There is no doubt that a great deal of business has been placed, and a great deal more is ready to be placed as soon as there is a reasonable certainty that prices are on a safe foundation. From the fact that so large a tonnage has already been engaged, it is clear that many prominent concerns have great confidence in values as they are to-day, but this is not always a sign of

infallibility, and particularly when Pig Iron is selling at over \$20 per ton. Nevertheless it is not improbable that a great deal of the buying is based on accurate knowledge of their own individual requirements, and, if they are large in some lines, others are likely to be in somewhat like proportion, hence (to say the least) it is a fair indication that no decline is deemed probable. Others are more conservative, on the ground that high prices stimulate production to the utmost limit, it cuts off export trade, and makes an opening for a variety of imports, all of which are bound to be felt sooner or later. At the present time arrivals from abroad are very heavy, and it is an open secret that purchases for American account in Great Britain and on the Continent have been exceedingly heavy during the past month or six weeks. Shipments are being made as rapidly as possible, so that 80,000 to 100,000 tons per month of various materials may be expected during the remainder of the year, which is pretty nearly a complete reversal of what was done three or four years ago. The Coal strike has dislocated business to a considerable extent, but that cannot last a great deal longer, and with normal supplies of fuel a much larger output is expected from the American furnaces. Undoubtedly consumption will be as large, most likely it will be larger, during the remainder of the year and the early portion of next year than it has yet been, but that is just what the trade is figuring on; less than that will be a disappointment and would probably weaken prices. As a matter of fact, when prices do begin to weaken they will weaken much easier than when they begin on a lower basis. At \$22 there is more room for a drop than there is at \$16 or \$18, and it is only a question of time anyway when the change will be made. At present, however, consumers are very glad to get No. 2 X Foundry for August and September shipment at \$23 to \$23.50, and 50c. less for October to December inclusive. In some cases friendless buyers have to pay a good deal more than the figure mentioned, but as we said last week it depends upon whose customer it is, and who can deliver the goods. For next year's delivery \$22 to \$22.50 is usually quoted, the latter figure for the first quarter, and the former, if it includes equal deliveries, for the full six months, and still better terms for deliveries covering the whole of 1903. Scotch and English Irons are on the spot, adroit and loading for Atlantic ports, prices being about the same as quoted last week, although if 1000-ton lots are wanted for shipment, they can be had for less money than is paid for spot lots. A fair average of to-day's prices would be about as follows for city and nearby deliveries during 1903, and from \$1 to \$1.50 more for this year's deliveries, the premium being mostly on Foundry grades:

No. 1 X Foundry.....	\$23.50 to \$24.50
No. 2 X Foundry.....	22.00 to 22.50
No. 2 Plain.....	21.00 to 22.00
Standard Gray Forge.....	20.50 to 21.00
Basic.....	20.50 to 21.00
Low Phosphorus.....	23.00 to 23.50
No. 3 Middlesboro.....	21.00 to 22.00
Scotch Irons.....	22.50 to 23.50

**Billets.**—New business is a little dull, but prices are steady and probably a shade firmer than they were a week ago. American is nominal at \$32 to \$33 for Bessemer, and \$34 to \$35 for Open Hearth. Foreign, \$28.75 to \$29.50.

**Plates.**—There is no decrease in the demand, and mills are kept full to their maximum capacity. It is difficult to name any particular class of work as specially prominent, as all lines appear to be equally busy. Bridge work is probably taking the largest tonnage, but, as we said before, all lines are busy. Prices very firm at last week's figures—viz: Small lots, 2.10c. to 2.15c.; Carload lots and upward, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.; Marine, 2.30c. to 2.35c.; Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3¼c.

**Structural Material.**—For some reason, not clearly understood prices seem to be considerably easier. It may be that the heavy imports of foreign material have relieved the situation, or it may be that the big concerns are making an effort to check further business of that character. Be that as it may, some who bought largely early in the year, and have been unable to get deliveries, are now suddenly flooded with pretty much all they bought. The claim is made that the mills were running on certain sizes, and so long as they were at it, they thought it would be advantageous to complete all the back orders they had on their books and get them out of the way. There is still a shortage of some sizes, however, but there is no doubt that orders can be placed at less money and better deliveries had than at any time during the year, ranging from about 2c. to 2.50c. for Beams, Channels, Angles, &c., according to quantity, delivery, &c.

**Bars.**—The demand is fully maintained and most of the mills have hard work to keep up with their orders. Prices are strong and most of the business is done at full quoted rates, although once in a while a desirable order may be taken at the inside figure, and in some cases a trifle less. Raw material is very high, however, and better prices should be obtained to secure a satisfactory margin of profit. Steel Bars are selling from local mills at 2c. to 2.15c. for quick shipment, but Western mills are taking orders at equivalent



to 1.82c., but there is no guarantee for delivery, although it is claimed that they expect to be reasonably prompt, say anywhere from 60 to 90 days. Refined Iron is quoted 1.50c. to 2c. for carload lots and upward.

**Sheets.**—The Sheet trade is improving and inquiries are being made for larger lots than has been the case for some time past. For first-class business favorable quotations are named, but for the general run of orders prices are about as follows for Best Sheets (Common one-tenth to two-tenths less): Nos. 10 and 12, 2.30c. to 2.40c.; No. 14, 2.50c.; Nos. 16 and 17, 2.70c.; Nos. 18-21, 3c.; Nos. 26, 27, 3.20c.; No. 28, 3.40c.

**Old Material.**—The market is irregular and on some articles prices are firmer; in others they are a little easier. Old Steel Rails have been sold at \$22 delivered, Chain at \$23, Iron Axles at \$31 and Car Wheels at \$20.50, the general market being as follows (bids and offers), deliveries in buyers' yards:

Old Steel Rails.....	\$21.50 to \$22.00
Heavy Steel Scrap.....	20.50 to 21.50
Low Phosphorus Scrap.....	27.50 to 29.00
Old Steel Axles.....	27.00 to 28.00
Old Iron Rails.....	24.00 to 25.00
Old Iron Axles.....	30.00 to 31.00
Old Car Wheels.....	20.00 to 21.00
Choice Scrap, R. R. No. 1 Wrought.....	23.00 to 24.00
Country Scrap.....	18.50 to 19.50
Machinery Cast.....	17.75 to 18.75
No. 2 Light Scrap.....	17.00 to 18.00
No. 2 Light Scrap (Ordinary).....	15.00 to 16.00
Wrought Turnings.....	16.50 to 17.50
Wrought Turnings, Choice Heavy.....	18.50 to 19.00
Cast Boring.....	10.50 to 11.00

## Cleveland.

CLEVELAND, OHIO, August 5, 1902.

**Iron Ore.**—During the past week there has been a continual congestion at the lower lake ports, and the upper lakes have also shown more boats at the docks than needed. The July shipment, however, indicates that the boats are more numerous than the shippers demand and that the delays to the vessels are not affecting the results.

**Pig Iron.**—The market has indicated this week, in the Foundry grades, that the foundrymen were looking for quite a great deal of material and the activity has been almost extraordinary. In many instances this has been due to the fact that the furnaces have been slow in making their deliveries. The call for Iron, even in excess of the contracts or possible sales, has been considerable, and all indications are that more material could be sold if the furnacemen had it to dispose of. What little material is finding its way upon the market is commanding towering prices, as No. 2 is bringing between \$24 and \$25, and the consumers seem willing to pay that price for their material. Not much is being done, however. The activity in Foundry Iron for next year's delivery is still very great. The reports are that many of the Valley furnaces have sold up their entire output for the first quarter of next year, and a few of them have disposed of their output for the first half. The selling has been so active for the first-quarter delivery that some of the furnaces which have been asking \$21 in the Valleys are now asking \$22 for No. 2. As this indicates, the foundrymen are facing the possibility of a continuance of the shortage of Pig Iron into the first quarter of next year. The business for the second quarter and later on has not developed sufficiently to warrant any statement as to the prospects for supply. The demand certainly promises to be satisfactory. The eagerness of some buyers has caused them to look even beyond the first half and a good deal of material has been sold for delivery into the third quarter, with more buyers covering their needs for the entire year. The furnaces are a little backward about making quotations for the second half of next year, not being certain what trend the market will take. In the Bessemer trade there is still a call for Iron for immediate shipment, but the furnaces have none to sell. The only transactions are among the consumers, who are still making trades of one sort of material for another, thus easing up several needs with a single transaction. All of the sales or transfers are on the basis of about \$24 at the furnace. The association furnaces have sold no material for second-quarter delivery of 1903, but the outside furnaces are still selling within their limits and, it is reported, are asking \$21 in the Valleys. The Basic producers are still selling some off-Basic, as it presents itself, at \$20.50 in the Valleys, and are still taking \$20 for second quarter of 1903 delivery for standard Iron. The selling has been heavy and the indications are that the supply for first and second quarter delivery will not last long.

**Finished Material.**—The demand for Plates, both for immediate shipment and for future delivery, has been extraordinary. Just now one of the first serious results of the dissolution of the Plate pool is being felt. The buying of material for first and second quarter delivery has continued, but it has been evident that the United States Steel Corporation alone has been doing the future business. The cause is a great disparity of prices. The corporation have been trying to stem the tide of high prices and are selling at

the old association price of 1.70c., Cleveland, while all of the independent mills, so-called, who broke away from the association, are refusing to sell material even for future delivery on a price less than the quotation for immediate shipment. Steel Plate producers are now able to get from 2c. to 2.10c. at the mills, according to the sort of Plates needed, and have insisted on carrying these prices past the first of January. During the past week some of the Cleveland consumers have come on the market for Plates for the first quarter delivery, and have been faced with the possibility of all of the Steel Corporation's output being sold up, hence, being forced to rely upon the supply from the independent mills and, therefore, five to eight months before deliveries are to be paid, are compelled to pay the premium of from \$6 to \$8 a ton. In Structural Steel the only material that is sold now is out of stock, except in those rare instances where some of the mills who reserved their capacity have a limited supply from which to make disposition. Some of the Eastern mills are in this position and are offering to place small amounts of material on the market here within a month, on which they are getting store prices ranging from 2.50c. to 3c. at the mill. Some consumers in this territory have been caught short for certain Shapes and have been compelled to pay the price on lots ranging between 300 and 500 tons. The example set by these mills is being followed by other small mills for next year's delivery and it is increasingly apparent that only the larger mills are making any considerable sales at the association prices, while the others are holding off for what the market may have to present. The Steel Corporation and other large mills are still selling for 1903 delivery at 1.60c., Pittsburgh. In the Sheet trade there is a continued demand for Blue Annealed and the prices are holding up. For the Galvanized Sheets of the lighter gauges—No. 20 and upward—there is a very poor market with falling prices. Those who have any of that material in stock would gladly get rid of it at about the buyer's own price. On the heavier gauges, however, there is a continued, strong demand, and the prices are holding at 2.50c. for No. 10 as a basis. In the Bar trade there is a growing demand for Steel and a lessening demand, with falling prices, for Iron. The Bar Steel supply is well taken up ahead, but still deliveries are possible within a reasonable period of two or three months and the prices are steady at 1.60c. for Bessemer, and 1.70c., Pittsburgh, for Open Hearth. Bar Iron is nominally quoted still at 1.80c., Pittsburgh, which does not represent the market, as all evidences are that any sales of that material must be at least on a parity with Open Hearth Steel. The price of Scrap, however, will not permit a profitable production at that price, and the mills are embarrassed. The demand for Rails keeps up, although it is moderating some as to next year's delivery. The inquiry for Light Rails for immediate shipment is brisk and the price ranges about \$38 to \$40 at the mill.

**Old Material.**—The Scrap market has been tame for the past week, with a good, steady, regular business, but without very much of a change. Those who are in need of material are buying at present prices, but no others are on the market. The quotations are continued as follows: No. 1 Wrought, \$19.50, net; Iron Rails, \$27.50, gross; Iron Axles, \$26, gross; Cast Boring, \$10, gross; Wrought Turnings, \$15.25, gross; Cast Scrap, \$16, net; Car Wheels, \$19, gross; Heavy Melting Steel, \$19, gross; Old Steel Rails, \$20, gross.

## St. Louis.

CHEMICAL BUILDING, August 6, 1902.—(By Telegraph.)

**Pig Iron.**—The market has shown considerably more vigor and snap the past week owing to increased inquiry and demand for Iron for the first half of 1903. In the matter of price the transactions have been on a basis of \$17 to \$17.50, Birmingham, for No. 2 Foundry. Spot Iron is as scarce as ever, and occasional car lots are about all that the market sees of this class of material. Owing to the heavy call for Basic Iron we understand the price has been advanced 50c. per ton for 1903 delivery. The following is the range of prices current for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$21.50 to \$23.50
Southern, No. 2 Foundry.....	20.75 to 22.75
Southern, No. 3 Foundry.....	20.25 to 22.25
Southern, No. 4 Foundry.....	19.75 to 21.75
No. 1 Soft.....	21.25 to 23.25
No. 2 Soft.....	20.75 to 22.75
Gray Forge.....	19.75 to 21.75
Southern Car Wheel Iron.....	to .....
Malleable Bessemer.....	to .....
Ohio Silvery, 8 per cent. Silicon.....	to .....
Ohio Strong Softeners, No. 1.....	to .....
Ohio Strong Softeners, No. 2.....	to .....

**Bars.**—The demand in hand reported by the jobbing interests of moderate volume. Price-lists show no change. We quote from the mills: Iron Bars at 1.90c., Steel Bars at 1.90c. to 2c. Jobbers quote Iron Bars at 2.25c., Steel Bars at 2.25c., full extras.

**Rails and Track Supplies.**—No change has shown itself to check the active condition of affairs ruling in this department of the market. Quotable prices continue the same, and

we quote Splice Bars at 2.10c. to 2.15c.; Bolts, Square Nuts, 3c. to 3.10c., with Hexagon Nuts, 3.25c. to 3.30c.; Spikes, 2.50c. to 2.60c.

**Angles and Channels.**—The jobbing trade are getting a moderate demand for small Angles and Channels, and prices rule as before. For materials of this class 2.50c., base, is the quotation.

**Sheets.**—The trade are meeting with a liberal demand for Sheets of various grades and sizes, and in the matter of prices pronounced firmness is the rule.

**Lead.**—Conditions are very little changed in the Lead market, and the week under review shows a moderate volume of business at old figures. Chemical at 3.97½c. to 4c. and Desilverized at 4.05c.

**Spelter.**—Transactions in the Spelter market are on a fairly liberal scale, and prices continue to harden. For August delivery 5.20c. is asked.

## Cincinnati.

FIFTH AND MAIN STS., August 6, 1902.—(By Telegraph.)

While the volume of Iron sold for next year's delivery is not as heavy as it was the week previous, yet the week just closed shows a very nice sales account to its credit. Unquestionably the volume was somewhat cut short by the further withdrawal of furnaces announcing that they were sold up for the first quarter of the year. There is an impression out in the field here that some of these furnaces, pretty important factors in the general market, while nominally announcing full books until next April, are really pretty well closed out until July 1. This, of course, is as yet largely a matter of conjecture, but it is only one of a number of minor issues which go to make the situation an extremely strong one. The announcement is made that there are still a few furnaces which will accept business for next year on the basis of \$17, Birmingham, freight rates not guaranteed, and this, of course, establishes the minimum, but it is a much more difficult matter to say what the maximum selling figure is. Iron is being sold openly at \$17.50, and possibly in some instances as high as \$18, where special circumstances prevail, but a number of furnaces are saying \$18 to \$19, Birmingham, or else no sale, these holding firmly to the belief that it will only be a question of time, at least, until they get their price. Now in regard to Iron for this year's delivery it is much more difficult to say accurately what the minimum quotation is. We are quoted but very few positive sales and these usually under conditions which make the figures of only relative value in determining the market; therefore the quotations given for spot Iron are given for just what they happen to be worth and it is not guaranteed in any sense that some grades of Iron can be bought for the figures given or, for that matter, any other figures. Spot Iron is very scarce, and the high grades bring practically what the seller chooses to ask for them. A sale of 500 tons of No. 4 Southern is reported sold for August delivery at \$18.25, Birmingham. Freight rate from Hanging Rock district is \$1.10 and from Birmingham \$2.75. We quote, f.o.b. Cincinnati, for 1902 delivery as follows:

Southern Coke, No. 1.....	\$23.00 to \$24.00
Southern Coke, No. 2.....	22.50 to 23.50
Southern Coke, No. 3.....	22.00 to 23.00
Southern Coke, No. 4.....	20.00 to 21.00
Southern Coke, No. 1 Soft.....	23.00 to 24.00
Southern Coke, No. 2 Soft.....	22.50 to 23.50
Southern Coke, Gray Forge.....	20.00 to 21.00
Southern Coke, Mottled.....	20.00 to 21.00
Ohio Silvery, No. 1.....	26.10 to 26.60
Ohio Silvery, No. 2.....	25.85 to 26.10
Lake Superior Coke, No. 1.....	26.10 to 26.60
Lake Superior Coke, No. 2.....	25.60 to 26.10
Lake Superior Coke, No. 3.....	25.10 to 25.60

### Car Wheels and Malleable Irons.

Standard Southern Car Wheels, chilling grades.....	\$27.75 to \$28.75
Lake Superior Car Wheel and Malleable.....	26.00 to 26.25

Quotations for first six months of 1903, f.o.b. Cincinnati, on present freight rates, are as follows:

Southern Coke, No. 1.....	\$20.25 to \$21.25
Southern Coke, No. 2.....	19.75 to 20.75
Southern Coke, No. 3.....	19.25 to 20.25
Southern Coke, No. 4.....	18.75 to 19.75
Southern Coke, Gray Forge.....	18.75 to 19.75
Southern Coke, Mottled.....	18.75 to 19.75
Southern Coke, No. 1 Soft.....	20.25 to 21.25
Southern Coke, No. 2 Soft.....	19.75 to 20.75

These quotations are made and all contracts signed with the understanding that the buyer assumes any freight differential existing at date of shipment.

**Plates and Bars.**—The general situation is strong and in the main unchanged, and while there has been some evidence of a disposition in certain localities to shade the standard price on Bars, 1.92c., f.o.b. Cincinnati, with half extras, yet sales made in the face of this competition show that the cuts offered must be very slight. In general the same bases of sale are still applicable.

**Old Material.**—The market is active and, in touch with everything else in the Iron line, quite strong. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$21 to \$21.25, net; Cast scrap, \$15 to \$15.25; Iron Rails, \$24 to \$24.50; Steel Rails, rolling mill lengths, \$24 to \$24.50; Steel Rails, short lengths, \$19; Iron Axles, \$28 to \$28.25, net; Car Wheels, \$20 to \$20.50.

## Birmingham.

BIRMINGHAM, ALA., August 4, 1902.

A report of the market this week is but a repetition of what has been said in previous letters. There is still an unsatisfied demand for spot and nearby delivery of Iron, owing solely to the lack of supply. The situation in regard to it is expressed in the statement there is no stock from which to draw to fill it. The filling of orders for spot or nearby delivery is simply a matter of favor or good fortune. Some hit it and get recognition, while others fail. There have been some sales at prices that indicate the great scarcity of Iron, and the absolute necessity that forces buyers to enter the market regardless of price. No. 2 Foundry sold at \$22.50, but only in small lots. In fact, the sales of cash and nearby Iron simply represent the sale of odds and ends of output that failed to pan out according to calculations. In some instances they represent resales; but to only a limited extent. Under ordinary conditions the demand prevailing would excite no comment. It is simply because of the exhaustion of stocks that it invites comment. A close inquiry as to actual sales developed the fact that for spot and nearby delivery they were insignificant. In fact, there is little or no disposition to report them. And it is equally a hard task to quote the various grades, for there is no guide to go by. It is surprising to note among the buyers so many whose wants are usually anticipated and provided for. But the present conditions are an exception to the rule and "the wise lacked wisdom."

There is nothing to be said about shipments beyond the fact that they are as active as facilities permit. The demand for 1903 delivery can be said to be only fair. Occasionally orders come that include the whole year. One order was received the past week for 7000 tons, extending in delivery from January to December; but, as a rule, they are limited to the first half of 1903. There are one or two instances of declination to quote prices for any forward delivery, as sales have already been made to what is considered prudent limits. What may be unsold of estimated capacity will be held for buyers of spot Iron. It is anticipated that prices obtained will justify this course. But the market is sold up so well that accumulation of any Iron will be at a mighty slow rate. Buyers should not forget that sales for 1903 up to the present time are 175,000 tons. In Steel about the same condition of affairs exists, as is stated, concerning Iron. Deliveries are overdue, and progress is slow in overtaking belated business. New business is like that in Iron. It can be stated that the leading interest is discouraging business for the first quarter of 1903, and for the second quarter are very conservative sellers, and that another large interest has sold for the first half of the coming year to within less than one month's production of anticipated output. So there is a very slim prospect for sharp competition in prices during that time. Some Iron has been sold at \$17.50 for the first half of 1903, but the bulk of the sales have been at \$17. There have been some scattering sales on an \$18 basis for No. 2 Foundry. That the feeling is very strong and the tendency toward higher prices it is useless to dispute, and it will stay that way until there is an accumulation of Iron either prospective or actual.

There has been a consolidation of two important Coal mining interests by which the Globe Coal Company ceases to exist and is absorbed by the Pratt Coal Company, and by this name the new corporation will be known. The charter was taken out in Delaware. It is capitalized at \$1,000,000, of which \$300,000 has been paid in. They have seven productive mines in operation now, and will increase production until the daily output reaches 5000 tons. The present capacity is 1600 tons daily. They own 11,000 acres of Coal lands near the Warrior River.

There was an important sale of Coal lands the past week, covering 1200 acres, the purchase being made for a Pennsylvania estate as an investment. The price obtained has not been made public. The property carries some valuable veins.

The Southern Cement Company have leased the Birmingham Cement Company, which gives the new arrangement a practical monopoly of the business here. The owners and managers are Eastern people with a long experience at the business.

There is more or less dickering going on for other valuable properties, which must be concluded in the very near future. Their successful conclusion will give a fresh impetus to affairs here. As it is, so many things are under way in the district that we are assured against any stagnation or dull times during this year.



## Pittsburgh.

(By Telegraph.)

PARK BUILDING, August 6, 1902.

**Pig Iron.**—The market is very quiet, but strong. Consumers are pretty well covered, furnaces have most of their output under contract for this year, and Pig Iron for prompt shipment is scarce. Several fair sized inquiries for Bessemer and Basic Iron for delivery in the last quarter are in the market. We quote Bessemer Iron at \$21 to \$21.50 at Valley for delivery this year. On a large lot of Bessemer Iron where deliveries would run into first quarter or first half of next year a lower price would be named. Forge Iron is \$20.50 to \$21, Pittsburgh, and No. 2 Foundry for prompt delivery is \$22.50 to \$23, Pittsburgh. For delivery next year No. 2 Foundry is being sold at \$21.50, Pittsburgh.

**Steel.**—The market is quiet and more Steel is being offered for prompt delivery than for a long time. It is evident that some of the Sheet and Tin Plate mills have overbought, as a good deal of Steel, mostly foreign, is being offered for resale. Foreign Billets can be laid down in Pittsburgh to-day at about \$30.50. Domestic Billets are held at about \$32, but on a firm offer a lower price might be secured. The outlook is strong, and prices of Steel will be lower within the next three or four months.

(By Mail.)

Some time ago a movement was inaugurated by F. A. Lapham, at that time general sales agent of the Tennessee Coal, Iron & Railroad Company, to have blast furnaces all over the country market their Pig Iron in tons of 2240 lbs. instead of 2268, as has long been the custom. This plan has already been adopted by leading Pig Iron makers in some sections, and several of the Mahoning and Shenango Valley furnaces will also likely adopt it before long. It would seem to be a great advantage to have a uniform ton of 2240 lbs., and to apply on Bessemer, Gray Forge and Foundry, as well as on Basic. There is little of special interest to note in the Iron trade this week. A large buying movement is in progress in Foundry Pig Iron for shipment next year, but Bessemer and Gray Forge are somewhat quiet, consumers being pretty well covered ahead, while furnaces have very little Iron to spare for delivery this side of January. In Finished Iron and Steel conditions are the same as for some weeks past. Plates and Structural Material are active, but Sheets, Tin Plate, Wire and Wire Nails are very quiet.

**Steel Rails.**—More orders for Rails have been booked by the mills, and it is said new tonnage booked for 1903 delivery will approximate 1,200,000 tons. Heavy Sections are \$28, at mill.

**Hoops and Bands.**—Tonnage in Hoops and Bands is not as satisfactory as it might be, and it is said a few of the mills are somewhat short of work. It is claimed that official prices are being firmly maintained. We quote Hoops at 1.90c. for 250-ton lots and over and 2c. in carloads. Bands are 1.60c. for Bessemer stock, 12-gauge and heavier, while for Open Hearth stock \$2 per ton advance is charged.

**Muck Bar.**—We are not advised of any sales of Muck Bar within the past week. We quote at \$36, Pittsburgh, for Standard grades. Eastern brands of Muck Bar are being offered in this market at lower prices.

**Spelter.**—The quotation in this report last week of 5.60c was a typographical error, and should have read 5.10c. Prime grades of Western Spelter are held to-day at 5c., St. Louis, equal to 5.13½c., Pittsburgh.

**Structural Material.**—Demand continues heavy, both for early and late deliveries, and Structural mills are sold up for anywhere from four to eight months. Figuring is being done on two large store buildings to be erected in this city, which will require from 12,000 to 15,000 tons. A great deal of railroad work is being placed, and the bridge shops are filled up for months ahead. The mills are trying hard to make more prompt deliveries, and the situation is already slightly better in this respect. Prompt Beams and Channels continue to bring from 2.50c. to 3c. per lb. Official prices are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Tees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c.

**Plates.**—The situation as regards deliveries has not improved any and Plates for early shipment readily bring from 1.75c. to 1.85c. at mill. A heavy tonnage is being placed right along and a great deal of work is in sight. The boat builders have been heavy buyers for some time and more tonnage from this class of consumers will soon be placed. Official prices, which really pertain only to Plates for delivery next year, are as follows: Tank Plate, ¼ inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$2 extra; gauges Nos. 7 and 8,

\$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

**Rods.**—The market is somewhat quiet, but prices are reasonably firm. Bessemer Rods are \$36, at mill, but on a firm offer this might be shaded.

**Bars.**—Tonnage has fallen off somewhat, more especially in Iron Bars, and the amount of new business being placed is smaller than for some time. However, the mills are well filled up on old contracts, specifications on which are coming in at a fairly satisfactory rate. We quote Steel Bars at 1.60c., half extras, for carload and larger lots, while small lots bring 1.70c. to 1.75c. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra, regardless of length. We quote Iron Bars at 1.80c. in carloads and 1.90c. in small lots, f.o.b. Pittsburgh, extras as per National card.

**Sheets.**—There is no improvement to note in the Sheet market, which continues very quiet and is disappointing to those who had hoped that tonnage would pick up before this. The new capacity in Sheets which has come on the market in the past year is now being severely felt, as there is not enough business being placed to go around and keep all the mills busy. Quite a number of Sheet mills are idle at the present time and output has been reduced a good deal. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.90c., and No. 28 at 3c. in carload lots. Jobbers charge 3c. to 3.15c. for No. 27 in small lots, and 3.10c. to 3.25c. for No. 28. Galvanized at net prices and in carloads are about as follows: No. 24, 3.70c.; No. 26, 4c.; No. 27, 4.25c.; No. 28, 4.50c. Prices to jobbers in very large lots are somewhat lower than these. Mills that sell on a percentage basis quote Galvanized at about 75 per cent. off in carloads. Small lots of Galvanized are 70 and 10 to 70 and 5 off. These prices are f.o.b. at mill.

**Skelp.**—The Skelp market continues dull and prices are weaker than for some time. A good deal of Eastern Skelp is being offered in this market at lower prices than domestic mills are naming. We quote Grooved Iron Skelp at 2.10c. to 2.15c., and Sheared at 2.15c. to 2.20c. Grooved Steel Skelp is about 2.15c. in large lots. These prices are f.o.b. at mill, terms 30 days, less 2 per cent. for cash.

**Merchant Steel.**—A fair amount of tonnage is being placed in Steels that are seasonable, but generally speaking new business is quieter than for some time. We quote Tire at 2.15c. to 2.25c.; Sleigh Shoe, 2.15c. to 2.25c.; Spring Steel, 2.20c. to 2.30c., and Toe Calk, 2.25c. to 2.35c.; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. off in less than carloads, delivered in base territory. Tool Steel is 6½c. to 8c. for ordinary grades, and 12c. and upward for special grades. These prices are f.o.b. at mill.

**Iron and Steel Scrap.**—Some dealers report a slightly improved demand in the last few days, while others say demand for Scrap is getting quieter. There is still some delay in getting deliveries of Scrap sold some time ago. We quote No. 1 Railroad Wrought Scrap at \$20 to \$21, net ton. Cast Scrap is \$19 to \$19.50, net ton. Cast Iron Borings are \$19.50 to \$21, gross ton, and Heavy Melting Stock is \$21 to \$21.50, gross ton.

**Merchant Pipe.**—The Pipe trade is in very satisfactory condition, and considering that this is the dull season of the year a very fair amount of new tonnage is being placed. The market is firm, and discounts in carloads as follows:

Merchant Pipe.	Black.	Galvd.
¾ to 1½ inch, inclusive.....	60	48
¾ to 12 inch, inclusive.....	67	55

**Coke.**—Motive power for moving Coke is again in bad shape, and blast furnaces are having more or less trouble to get Coke as fast as needed. It is said the lack of terminal facilities at Connellsville seriously handicaps the movement of Coke from that point. The *Courier* reports the output of Coke in the Connellsville region last week as 249,615 tons, and shipments 11,777 cars. Furnace Coke, on contracts, is about \$2.25, but for prompt shipment brings \$3.50 to \$4 a ton. Foundry Coke is \$2.75 to \$3 a ton on contracts. Most of the Coke companies have nearly their entire output under contract. Demand for Coke is the heaviest ever known in the history of the Coke trade, and output this year will break all previous records.

At the annual meeting of the Susquehanna Iron & Steel Company, Columbia and Philadelphia, Pa., held August 5, the following directors were elected: Charles A. Porter, H. F. Bruner, Dr. L. S. Filbert, J. W. Steacy, Percy M. Chandler, W. S. Kimball, Henry Clay, W. H. Butler and R. T. Houston. Charles A. Porter was re-elected president; H. F. Bruner, vice-president; R. G. Filbert, secretary, and J. W. Steacy, general manager. The result of the meeting shows that ex-Senator Porter and associates still retain control of the company.

## The Chicago Machinery Market.

CHICAGO, August 1, 1902.

In the machinery manufacturing industry the month of July has been little different from the preceding months of the year. The record has been one of great activity and uninterrupted prosperity. Many of the larger manufacturers still find their facilities inadequate, and are making further extensions and adding constantly to equipment; yet, even so, find the orders are accumulating beyond their ability to fill promptly. There is scarcely a line of the machine industry that is not sharing in the increased volume of business. Manufacturers of power transmitting machinery and producers of engines are especially active. In such lines as flour mills, saw mills and mining machinery, including rock and ore breaker devices, conditions are especially encouraging. Orders are still being received from bridge works, locomotive and car works, steel and iron plants, oil mills, cement mills, grain elevators, refrigerating machinery, &c.

There are a few notes, however, not in full harmony with the general chorus of reports. These come from dealers, however, rather than from manufacturers, and even these report business for July beyond expectations, although less than during the two preceding months.

The outlook for a continuance of the present activity is good, there being many orders in sight and business booked ahead for 60 to 90 days by most lines; in special instances contracts secured which will require six months or more to fulfill. The difficulty is rather to obtain ample supplies of raw materials and to make the deliveries desired by purchasers than to obtain contracts. The advance in prices of castings and in most lines of machinery seems rather to have stimulated than to have checked the buying.

Dealers in second-hand machinery continue to reap a harvest from the inability of manufacturers to make prompt shipments for some special lines of machines, but even the second-hand dealers find it difficult to obtain all the engines, boilers and tools that the inquiries call for.

Orders are by no means confined to the domestic trade. Some especially heavy contracts have been booked during the past two weeks for foreign shipment. Among the more notable may be mentioned; Cross compound engines for the London tramways, two for South America, mining machinery to Mexico, gas and gasoline engines to Mexico and Australia, machine tools to Spain, and special supplies to Bombay, India. Canada has also taken engines, boilers, mining and miscellaneous machinery to a liberal extent. An interesting feature has been the liberal buying of mining machinery and boilers and engines by the Pacific Coast.

The following reports from manufacturers and dealers in this section are of unusual interest, and reflect conditions of prosperity almost without precedent.

### Power Transmission Machinery.

The Webster Mfg. Company of Chicago have taken some large contracts for transmission and conveying machinery for some cement plants in Canada. There is no indication of a let up in orders. They are sold ahead for several months.

Pawling & Harnishfeger, Milwaukee, Wis., believe that the present strong position of the iron and steel market has a direct bearing upon the demand for electric traveling cranes and hoists. They state that the present booking of orders is excellent, and the net results of their business for the first half of this year highly gratifying. Notwithstanding their recent acquisition of the shops at 187 to 189 South Water street and the warehouse on Clinton street and the Northwestern tracks, they find themselves still short of room. Their negotiations for additional space have resulted in securing within the last ten days the Gardiner-Campbell Company property adjoining a portion of their last works. This new property is 200 x 150 feet in size, and runs to Barclay street, and the three-story factory building upon this ground is now being remodeled to supply an additional machine shop, with the upper floor to be arranged for extra pattern storage. The building heretofore used as a foundry is being entirely changed with an addition made thereto, and a modern foundry equipment is to be installed in the entire building. Included in the improvements will be two Pawling & Harnishfeger electric traveling cranes. The present power plant is being enlarged, and new boilers, engines and another generator will be provided. These improvements will considerably shorten the time required to complete a crane. In the last sales statement rendered by this firm mention was made of the good outlook for business in the Central and Western States, and this prediction is proven in the list given below: Minneapolis Steel & Machinery Company, Minneapolis, two 20-ton cranes with 5-ton auxiliary hoists;

one 15-ton crane with 5-ton auxiliary hoist; one 5-ton crane; Crane Company, Chicago, one 2-ton crane; Wisconsin Bridge & Iron Company, North Milwaukee, one 10-ton crane; Baldwin Locomotive Works, Philadelphia, four 10-ton cranes; the Standard Steel Works, Burnham, Mifflin Company, Pennsylvania, two 10-ton cranes; Pennsylvania lines west of Pittsburgh, Fort Wayne, Indiana, one 10-ton crane; Moran Bros. Company, Seattle, Wash., one 5-ton hoist; Columbus Iron Works Company, Columbus, Ga., one 20-ton crane; Lalance & Grosjean Mfg. Company, Sharpsburg, Pa., two 3-ton cranes; the Spang-Chalfant Company, Sharpsburg, Pa., two 3-ton cranes; the Ball Engine Company, Erie, Pa., three 3-ton hoist travelers; the Berlin Machine Works, Beloit, Wis., one 15-ton crane; the American Bridge Company, Economy, Pa., five 10-ton cranes, each with two 5-ton trolleys; the Ohio Farmers' Fertilizer Company, Columbus, Ohio, two 3-ton hoists; Betts Machine Company, Wilmington, Del., one 20-ton crane.

The Industrial Works, Bay City, Mich., state that they are taking contracts fully equal to their capacity, and business continues very satisfactory with them.

The Stephens-Adamson Mfg. Company, Aurora, Ill., have work ahead for the next 90 days, and, in fact, more work than they can conveniently take care of. The character of the work they have on hand is contracting for elevating and conveying machinery, also power transmission machinery for various grain elevators, cotton seed oil mills, cement mills and manufacturing plants in different parts of the country. The demand for everything in their line of manufacturing is most excellent, and prices are somewhat higher than 60 days ago. They are getting work these days at very satisfactory prices.

### Special and General Machinery.

The Allis-Chalmers Company, Chicago, are constantly taking steam power plant orders of the first magnitude. The flour mill and saw mill departments are in an exceedingly flourishing condition, while the mining machinery and rock and ore breaker departments are in a very healthful state. They are employing over 5000 high grade mechanics. They have finished one section of their new West Allis plant, and are rapidly pushing the others to completion, having been delayed only by the structural iron manufacturers and tool makers. The delays, however, have only been such as can naturally be expected. The special tools being built for them as a rule are of a very heavy pattern, especially adapted to their work, and consequently built to order. They are constantly adding to the tool equipment of all their other shops, all of which have been brought up to a first-class equipment throughout and their efficiency proportionately increased.

Novelty Iron Works, Dubuque, Iowa, report that there is practically no let up on orders for the power hammers and the single machines manufactured by them, and the outlook for the fall trade is very good. It seems almost impossible to catch up with back orders and to accumulate stock enough for current business.

McDowell, Stocker & Co. of Chicago state that while they have been comparatively busy during the whole month, yet the business that they have booked has not been quite up to the month previous, but it usually occurs that machinery business drops off somewhat during the summer months. They anticipate a good fall trade.

The Vilter Mfg. Company, Milwaukee, Wis., state that they are well satisfied, as they have closed quite a few contracts the early part of the month, and the outlook in their line of ice making and refrigerating, brewers' and bottlers' machinery is quite good.

### Machine Tools.

The B. F. Barnes Company, Rockford, Ill., say that during the past year they have been obliged to make additions to their plant and to put in several new tools. Business for the month of July has been far beyond their expectations, the demand being greater than their ability to take care of, and they have every reason to believe that the good business will continue.

The Kempsmith Mfg. Company, Milwaukee, Wis., report that the prospects for the sale of "millers" during the balance of the year seem very bright. Inquiry is unabated and comes from reliable concerns. As was to be expected in July, orders have not proven quite so plentiful, but they look for more than the average business in August. Demands upon their capacity have compelled the installation of additional machine tools.

Ransom Mfg. Company of Oshkosh, Wis., report the last month as having been the best they have had for several years. This is probably due to their having brought out some new tools which are attracting attention. Among other orders landed during the last month they report some from the Allis-Chalmers Company and the General Electric Company.

The New Doty Mfg. Company, Jacesville, Wis., say that business keeps up well; they are full of orders and have a large amount of work ahead of them. They consider the prospect of trade good for some time to come.

The Geo. Whiting Company, Chicago, during the month of July have been very successful in closing contracts for a number of machines for some of the leading concerns in the West, and are now building the following machines: Belt



power riveter for the Atlas Engine Works, Indianapolis, Ind.; 18-inch punch for the Garden City Iron Works, Chicago; 42-inch punch for the Carl Binder's Structural Iron Works, Chicago; a large shear for the Inland Steel Company, Indiana Harbor, Ind. They have several propositions from other concerns which they expect to accept, and altogether the month of July has been a very successful one. In a week or two they expect the new plant will be running with a full force, and if they can secure even a small fraction of the work now in sight, they will have work enough to last six months to a year. They are in shape to make reasonably prompt delivery, although they have found it necessary to double the size of their pattern room to take care of the business, and feel greatly encouraged with their introduction to the trade in so short a time. Except the increase in price of castings, which necessitates an advance in the price of machinery, they see nothing to interfere with the present demand for a long time to come.

#### Engines, Boilers and Pumps.

At the Milwaukee works of the Allis-Chalmers Company during July a number of orders that have been under negotiation for some time have been closed, among the more important being: Four steeple compound blowing engines for the Buffalo & Susquehanna Iron Company, Buffalo, N. Y.; vertical cross compound engine of 1500 horse-power for the London United Tramways, London, England, this being the fifth engine for their station; engines for the Milwaukee Electric Railway & Light Company, two 1800 horse-power vertical cross compound, the same type now installed; a vertical blowing engine, being the third of this type, for the Tonawanda Iron & Steel Company, North Tonawanda, N. Y.; six steeple compound blowing engines and two single vertical blowing engines for the Cleveland and Pittsburgh plants of the American Steel & Wire Company, and for the Brunswick, Balke, Collender Company, Chicago, a 1000 horse-power horizontal engine, which will be direct coupled to electric generator. They have also sold two compound engines of 500 horse-power for export to South America, and fully the usual number of lesser orders have come to hand.

The Manistee Iron Works, Manistee, Mich., say that business is fair. They took two small contracts this month for the West.

The Union Steam Pump Company, Battle Creek, Mich., say that their business still continues at full tide with small prospects of running out. They are simply flooded with business, and are experiencing some difficulty in obtaining material. With them it is harder to find material than to fill orders.

Quincy Engine Works, Quincy, Ill., state that the works are enjoying a fair share of business. The company have a number of contracts and prospects of others. The shop has been running overtime for some months. They consider the future prospects of the sale of high grade engines excellent.

The Otto Gas Engine Works of Chicago have found the month of July an unusually busy one, with considerable difficulty in getting the material necessary to erect complete plants on contract work, and their railway department is full of work, which consists largely of the installation of electric lighting plants and water pumping plants for railway companies.

American Steam Pump Company of Battle Creek, Mich., have found their business during the month of July to be the largest in the history of their company. They have added about \$15,000 worth of new machinery since the first of the year, and are now building a three-story and basement fire proof pattern house. They do not see any indication of a decrease in general business, and believe that America has the money, enterprise and brains to continue the present conditions indefinitely.

The S. Freeman & Sons Mfg. Company, Racine, Wis., have found business exceedingly good for the last 30 days. Many inquiries are coming in for boilers, and more especially for the internally fired boilers. They make a specialty of this type of boiler, and have in the last few days entered orders for 800 horse-power, averaging 200 units; also an order for a very large marine boiler to go to Oregon. There seems to be an increasing demand in the boiler line coming from the Pacific Coast. They look forward to a very busy fall.

The Nordberg Mfg. Company, Milwaukee, Wis., found inquiries during July as frequent as at any previous period; in fact, rather more so. Intending purchasers care little for prices, insisting only on early shipments, and this, in most cases, cannot be guaranteed.

The Weber Gas & Gasoline Engine Company, Kansas City, Mo., advise that business up to date continues very good, indeed. They have booked a number of important contracts during the month now ending, and the volume of business, on the whole, is very satisfactory; the prospect for future trade this year is very bright, indeed. They have recently shipped the Batopilas Mining Company of Batopilas, Mexico, a large amount of gasoline driven machinery, including a gasoline locomotive for mine haulage. Also shipped six engines to Sydney, Australia, and at the present time have under construction a number of large plants for hoisting and air compressing for Western mining companies. Improvements in their new plant for the last six months con-

sist of two additional warehouses and 100-foot extension to the foundry, and the erection of a separate building for wood working department.

The Marinette Iron Works, Marinette, Wis., have found business very good, having shipped a number of large engines to various points in this country, as well as several export shipments, most of which are being installed in the electrical service. They have many orders booked for future delivery on various size engines, and the indications are that this will continue.

The Charter Gas Engine Company, Sterling, Ill., report that business in gas engines and power transmitting machinery for the month of July has been very satisfactory. The erection of the new building upon which they have been employed has been delayed by wet weather.

#### Tools and Supplies.

Jos. T. Ryerson & Son, Chicago, report the condition of the machinery market as intensely interesting. Months ago it seemed that the demand for heavy tools had reached its maximum, and that it must abate. The existing conditions are quite the contrary, as the demand for very heavy equipment is larger than ever before, and the new plants being designed will probably maintain the present very heavy tax on machinery builders. The manufacturers' deliveries continue to be remote, as they are maintaining the high quality of their product even under the most excessive pressure for early deliveries. The same conditions prevail in an exaggerated form for the small tools and machinery, and is even more emphasized in the smallest equipments. Among the buyers who have purchased during the past 30 days are the following: East Jersey Pipe Company, Columbiana Boiler Company, Stillwell-Bierce & Smith-Vaile Company, New Winona Mfg. Company, Vance Boiler Works, Rural Mail Box Company, Joliet Bridge & Iron Company, Standard Oil Company, Chicago, Burlington & Quincy Railroad Company, Holthoff Machinery Company, Topeka Steam Boiler Company, Raymond Bros., Galana Mill Supply & Iron Company and Gardner Air Compressor Company.

The Filer & Stowell Company of Milwaukee, Wis., report that the output of the Milwaukee foundries is now about 90 per cent. of normal. The core makers are still out on a strike, the good ones either having returned to work or left town. Aside from the core makers' trouble everything is running along about as usual.

Hoefler Mfg. Company, Freeport, Ill., report their business as good as at any time in the past, with very bright prospects. Thus far they have been unable to make any tools of any kind for stock, and their business does not seem to indicate any vacation.

The Anderson Tool Company, Anderson, Ind., state that the trade on electrically driven grinders for the month of July has been very satisfactory. They are now manufacturing these machines to be belt as well as electrically driven. They have increased their facilities, so they are now in position to fill orders with reasonable promptness.

The Stover Mfg. Company, Freeport, Ill., say that the month of July was rather dull. First, because it is always an off month with them, owing to the fact that the farmers are very busy and will not spend the time to purchase wind mills. Second, the continued wet weather had its effects also upon the wind mill business, resulting in light trade. As far as the hardware business is concerned, it was also the lightest month they have had for some time, so that their business for the month was considerably less than the previous month, but equally as good as the corresponding month of last year. The indications for after harvest and fall trade are most promising.

J. H. Dawson Machinery Company of Chicago say that their business has been somewhat lighter during the month of July than it was in June, which was partly caused by the freight handlers' strike, although they consider trade as good as could be expected at this season of the year. They have made no specially important contracts to speak of, most of the business being small orders for single machines. The bulk of the business has come from well established firms rather than from new concerns.

Chas. H. Besley & Co. of Chicago state that their general business is very good. At this season of the year they are making large shipments of Helmet oil, Badger and Bonanza grease cups to the agricultural districts. They are especially busy at their factory at Beloit, Wis., in the tap and die department, grinder department and grease cup department, and are making daily shipments of these specialties to all parts of the country. Recently they received an order for a Gardner grinder from Bombay, India. They consider the outlook for the future very bright.

The Whiting Foundry Equipment Company, Harvey, Ill., state that July business has been very satisfactory, both as to actual orders and inquiries for future work. Among the various orders received during the past week is one for a four-motor electric traveling crane, 20 tons capacity, from the city of Chicago. They are adding a few cranes, some tools, punches, &c., to their shop in the way of improvements.

The S. Obermayer Company, Chicago, state that business is exceedingly brisk. Never before in their experience have they had so much business at this time of the year. They recently sold Whiting cupolas to the following concerns:

The Stoddard Mfg. Company, Dayton, Ohio; the Belleville Foundry & Machine Company, Belleville, Ill.; Battle Creek Iron Works, Battle Creek, Mich.; Stillwell-Bierce & Smith-Vaile Company, Dayton, Ohio; Deere & Mansure Company, Moline, Ill.; Globe Iron Works, Stockton, Cal.; Western Foundry Company, Chicago, Ill.; Peck-Williamson Company, Wellston, Ohio; Northwestern Malleable Iron Company, Milwaukee, Wis. Foundry equipments have been shipped to the Allis-Chalmers Company, Milwaukee, Wis., and to the Laidlow-Dunn-Gordon Company, Tweedvale works, Ohio. Business prospects are very bright, and they anticipate having the largest year in their business experience.

The Chicago House Wrecking Company, Chicago, say that business has never been better. There seems to be no cessation of orders. The outlook for a heavy call in the machinery line is extremely encouraging. The greatest difficulty we have experienced thus far is our inability to ship material as quickly as we would like. This has been caused considerably, of course, by the recent railroad strikes in Chicago. The demand for second-hand machinery is ever on the increase, especially in times like the present, when it is high impossible to obtain delivery with any degree of certainty from the manufacturers. Among their more prominent deals during the past month are mentioned the California Mining Company, a complete equipment, consisting of compressors, a battery of boilers and a 20 x 32 Webster, Kamp & Lane hoist; to Montreal a stone crushing outfit, consisting of automatic engines, fire box boilers and a portable crusher; they have also shipped an entire equipment into Canada, consisting of 125 high speed engine with boiler; to a Southern concern a 175 horse-power Corliss engine, with horizontal tubular boiler, duplex feed pump and heater; to a large milling concern in the West a 30 x 48 Corliss engine, with a battery of 1000 horse-power water tube boilers. They have just made shipment to Georgia of three carloads of machinery, consisting of boilers, engines, heaters and pumps. Engines and boilers seem to be the ruling factors. The hardest part of the business seems to be in getting material enough to meet demands. They have been fortunate this month in securing for immediate shipment a 900 horse-power Corliss engine, also a number of larger sizes of high grade automatic engines.

### Boston Machinery Market.

BOSTON, MASS., August 2, 1902.

Among the projected improvements at the Charlestown Navy Yard was a steel and concrete subway 6 feet square, which was to contain the pipes and wires conveying pneumatic and electric power to all the shops and ships. A prominent contracting firm and Civil Engineer Richard C. Hollyday, who has charge of the work for the Government, made an estimate on the probable cost of building about 1500 feet of this subway, the amount it was intended to build this year. The Government called for bids, but only one was received, and that called for an outlay of \$21,000 more than the estimate. This unexpected cost will probably result in the abandonment of the project, as the Government will probably devise some other method for transmitting power about the yard. Eleven large buildings and a coaling plant are in course of construction at the Navy Yard. Sixty per cent. of the steel frame of the ship fitters' shop has been erected, 15 per cent. of the steel is on the ground, and the remainder is on the way. None of the steel for the metal workers' shop has been delivered. These buildings are to be the most costly of those now being built. Each will occupy 110 x 450 feet ground space and be 41 feet high, and the two will cost approximately \$325,000. Nearly all this work is done by contract. The smithery will cost \$140,000. It will be built of steel and brick, and the Government will soon call for bids thereon. All of the steel in the construction department's power house is in place. This building measures 95 x 110 feet. The basement will contain boilers, pumps and auxiliary machinery. The foundations for the double building for the yards and docks department are all in place. This building is to contain a shop 60 x 200 feet, a power house 104 x 120 feet and a connecting wing 25 x 60 feet, and is to be finished next January; the cost to be \$140,000. The gate house is to be built of brick and steel with terra cotta trimmings. It is to be two and one-half stories high, cost \$25,000, and to be used by guards. Sixty per cent. of the steel for the chain and anchor storage shed is up, and the remainder has been received. This building will measure 60 x 400 feet, and will cost \$90,000. Machine shop No. 1, Building 42, is to be practically rebuilt at a cost of \$60,000. The steel is all in place. The Government is preparing plans for rebuilding machine shop No. 2, at an expense of \$50,000. Building No. 40 is awaiting the arrival of its steel roof. It will measure 179 x 281 feet, and cost \$100,000.

The Hoosac Valley Street Railway Company have petitioned the Massachusetts Railroad Commissioners for authority to issue additional stock amounting to \$300,000, a portion of the proceeds to be used in purchasing additional equipment, reconstructing tracks and building an additional power house. The company are controlled by the Pittsfield (Mass.) Electric Street Railway Company.

The Morrill & Whiton Construction Company of the Dorchester district, have obtained the contract for installing the plumbing, heating and electrical equipment of a new primary school house, to be built in that district of Boston. The contract also includes the construction of the building, which will contain concrete and steel stairs.

The American Bridge Company of New York have obtained the contract for building three steel bridges on the Central Massachusetts Railroad in the towns of Berlin and Clinton, Mass. The company's bid was \$91,450. The other bidders were the Boston Bridge Company, \$94,500, and the Phoenix Bridge Company of Boston, \$94,800. These bridges are to be built by the Massachusetts Metropolitan Water and Sewerage Board; it having been necessary to relocate the railroad, owing to the plans for the Metropolitan Water and Sewerage system now being constructed.

About 850 employees at the American Tube Works in Somerville, Mass., struck July 29 because the company discharged two men who had been prominent in labor union work. The matter was laid before the State Board of Conciliation and Arbitration. At a conference before the State Board the company granted the men's request for the reinstatement of the discharged employees, and the strikers returned to work on July 31.

### The Philadelphia Machinery Market.

PHILADELPHIA, PA., August 4, 1902.

Business conditions in the Philadelphia machinery market during the past month have been generally satisfactory. The summer season is not usually productive of much business, but a good volume has been secured by most all manufacturers. In some cases there has been a little easing up, but at this time of year it is not unexpected, and as a large amount of business is on the books and every one is busy, some having their output for the last half of the year already contracted for, and others with orders enough to keep them running well into next year, the present easing up of new business is causing no anxiety whatever. On the whole, every one is well pleased with the outlook for continued activity for some time to come.

Labor difficulties continue to be the cause of more or less trouble, the anthracite miners' strike does not seem much nearer settlement than it was last month. Meanwhile anthracite for manufacturing purposes is practically out of the market; what can be had commands a high premium, while bituminous, owing to the largely increased demand, has also advanced materially. These difficulties, together with the continued shortage of pig iron and other material, have not made the manufacturers' lot any easier when the delivery of machinery and tools is considered. There has been a slight falling off in inquiries in a few lines, which, however, is customary during the summer months, but the general volume is quite satisfactory.

There is no general indication of a resumption of the active foreign trade which we had a few years ago, but there has been a marked increase of business in some particular lines, notably in that of pneumatic tools, of which foreign shipyards and other plants have recently been large buyers.

Deliveries still continue to be unsatisfactory, both to the purchaser and manufacturer. The delay in obtaining castings, plates, shapes and other supplies increases, and the time of delivery of machinery and tools is therefore more extended. This is particularly the case with heavy machinery and tools, while the smaller and lighter tools, &c., can be delivered with a fair degree of promptness.

Iron and steel foundries continue rushed with orders, and deliveries from these sources are no better than they have been for months past. The delay in obtaining raw materials together with the fuel shortage is largely responsible for this condition. Some foundries have been compelled to shut down for several days at a time, owing to their inability to obtain one or the other raw material. There have also been delays in some plants, owing to labor difficulties with molders, but satisfactory adjustments have been made in nearly all cases.

Prices at this time are strong, the recent advances by some manufacturers have had a good effect on the market, and there is a greater tendency to stand firm on quotations. A number of manufacturers outside the agreement have recently asked and obtained better prices for their tools than for some time back.

The Philadelphia Steel & Iron Company, Frankford, Philadelphia, have bought the plant, franchise, patents and business of the Ferro Carbon Castings Company of Frankford, Philadelphia, and will continue the manufacture of Atlas



steel castings. The company are capitalized at \$1,000,000, and contemplate largely increasing the works at Frankford, so as to meet the growing demand for this class of steel castings. It is proposed to erect in the near future an open hearth steel plant, in addition to the other improvements, in order to more fully satisfy the demands of customers for steel castings of different kinds. The management of the works at Frankford will be unchanged, and it is expected that an improved equipment will enable the company to do a much larger and in many respects a more satisfactory business than in the past. The officers of the new company are: J. Wesley Allison, New York, president; Alfred C. Rex, Philadelphia, vice-president and general manager; G. H. Meldrum, New York, secretary and treasurer.

The Pennsylvania Railroad has started operations on the new shops to be erected at Sheltport, near Wilmington, Del., for the Maryland division of the Philadelphia, Wilmington & Baltimore Railroad. These shops are to be of modern brick construction, and will be equipped with the latest improved machinery. There will be some 13 different buildings covering quite a considerable area, embracing among them a drying kiln, planing mill, boiler, electric and hydraulic houses, blacksmith shop, car erecting shop, oil, waste and storage house and a locomotive round house.

Thomas H. Dallett & Co. report conditions as satisfactory for the season. Inquiries are of good volume, and some nice orders have been booked. A number of rope driven and electric portable drills have been shipped during the month, many being duplication orders. Trade in pneumatic tools has increased, the recent improvements to these tools being especially advantageous, and a considerable number have been sold.

The Philadelphia Pneumatic Tool Company continue very busy, orders for their various tools have been numerous. Foreign demand has increased, particularly in England, Spain and some other parts of the Continent. A large domestic trade is also to be noted, particularly on the Pacific Coast. Some recent deliveries include 20 No. 9 riveting hammers for the Lackawanna Steel Company, Buffalo, N. Y., and others to the Middle and Far West. Numerous shipments have also been made for export.

The Falkenau-Sinclair Machine Company have been formed by the consolidation of the Philadelphia Machine Tool Company, 445-449 North Darien street, and A. Falkenau, 109-115 North Twenty-second street, to which address the former plant has been moved. The new company have taken over the entire plants and business of both the above, and the largely increased facilities they expect will enable them to give prompter service and at the same time maintain the reputation for workmanship they have hitherto enjoyed. Designing and building high grade machine tools, special machines and contracting for machines in quantities will have their special attention, and a full line of presses and machines for working sheet metal, hydraulic machinery and testing machines will be continued and extended. Among some recent shipments by the Philadelphia Company are: Five No. 4 presses for Western delivery, one 200-ton hydraulic press for local parties and a 12,000-pound straight sided press for a Southern concern. The Falkenau branch recently delivered a special punch with automatic spacing table, 40 feet long, to the Baldwin Locomotive Works and six special grooved governors, of 5500 horse-power each, for use in connection with the turbines of the Niagara Falls Power Company, Niagara Falls, N. Y. A large special saw for cylinder casings has also been shipped to the Baldwin Locomotive Works.

The Espen-Lucas Machine Works, who were recently formed, have installed all their machinery, and are building particularly a new cold saw cutting off machine, designed by Wm. H. Lucas, which is a radical departure in that line of tools. They are being built in three styles for cutting off bars, I beams and steel foundry use. Three sizes are made of each style. Several Nos. 1 and 2 machines have already been delivered to various parties.

The Franklin Machine Works, Incorporated, report inquiries to be of a satisfactory nature, with orders in proportion. All departments of their plant are being operated on full time, and a large amount of work is in course of construction. Two No. 3 and one No. 4 floor boring, milling and drilling machines have recently been shipped to Western parties. Several cold saws and a grinder have been shipped to the Middle West, and a number of tools will shortly be shipped for New England delivery.

The American Pulley Company continue busy in all departments. A good amount of business is daily being received, and conditions for the fall trade are favorable. The export demand has increased, and large shipments on this account have been made to Australia, New Zealand and Copenhagen, Denmark. Besides their regular line of all wrought steel pulleys, this company are now placing on the market a wrought steel jack spool for the textile trade, and the American Steel Whole Pulley, which they make to order in sizes from 4 to 16 inches in diameter.

The Link-Belt Engineering Company have booked an order from the Norfolk & Western Railroad Company for three coaling stations, one to be located at Roanoke, Va.; one at Crewe, Va., and the other at Bluefields, W. Va. These plants will be of 600-ton coal capacity each, and will also be

equipped to handle sand and ashes. A large amount of general business in conveying and other machinery is on their books, and all departments of the plant are kept continuously busy.

The Tabor Mfg. Company continue quite active, a large quantity of work is on their books and a good amount of new business continues to come in. Among some recent shipments of molding machines may be mentioned, one each of the power ramming, split pattern type, 16½ x 21 inches, for molding journal bearings to the Pennsylvania Railroad Company and the Chicago, Burlington & Quincy Railroad. Six machines, one 24 x 36 inches, one 18 x 26 inches, two 18 x 30 inches and two 30 x 30 inches, have also been shipped to various plants of the Niles-Bement Pond Company.

The Eynon-Evans Mfg. Company have recently secured property adjacent to their plant for a store room and warehouse. This property, which is L shaped, three-story brick, having over 9000 square feet of floor space, gives them a much needed improvement, allowing for the storage of rough and finished goods. The upper floors being used for pattern storage, a large amount of space is made available in the shop proper, particularly in the pattern and machine shops, which are very busy. A large amount of pattern work for the Bethlehem Steel Company, William Cramp Ship & Engine Building Company, the Midvale Steel Works and for their own use is on hand. The foundry is especially busy on a large amount of general work, and the demand for blowers is good, some recent shipments to England, Scotland and Wales are to be noted.

The Energy Elevator Company continue busy, particularly in the local trade, where a large amount of work has developed, owing to the city ordinance requiring safety devices on elevators, and they are equipping a large number of elevators with their patent Energy Speed governor. Two elevators have been recently shipped to Moorestown, N. J., one of which was a large power furniture elevator. A large shipment of elevator parts was shipped to St. Johns, Mich., and a number of orders are on hand for city parties.

The J. W. Paxson Company will install four 76-inch Paxson Colliery cupolas in the new additions to the Baldwin Locomotive Company's plant at Burnham, Pa. New cupolas are also to be furnished the Eastern Steel Company, Pottsville, Pa., and the Kutztown Foundry & Machine Company, Kutztown, Pa., while considerable foundry machinery, molding machines and two Paxson-Warren sand blast apparatus have been furnished the Uniform Steel Company, Newark, N. J. The general foundry trade is said to be good, and a large amount of business is on their books.

The Baldwin Locomotive Works are running their various departments at their fullest capacity, endeavoring to produce a record output for the year. Business continues just as pressing as for some time past, and a large number of orders are on the books. More or less delay has been encountered in making prompt deliveries of locomotives, owing particularly to the delay in obtaining materials contracted for, deliveries on some of which are several months behind. The new tank shop, building at Eighteenth and Hamilton street, has been completed, and is now occupied, but work on the new boiler shop at Fifteenth and Buttonwood streets does not go forward as rapidly. Shipments of locomotives made recently include a number to the Pennsylvania Railroad, Atchinson, Topeka & Santa Fé Railroad, Denver & Rio Grande Railroad, Lehigh Valley, Southern Pacific Railway and a heavy freight engine has also been delivered to the Huntingdon & Broad Top Railroad.

The Royersford Foundry & Machine Company, Royersford, Pa., advises us that punching and shearing machinery continues active, shipments having been made to all parts of the country. A carload of these tools was recently shipped to the Marshall & Huschart Machinery Company, Chicago, Ill. Several machines have also been shipped to Manning, Maxwell & Moore, New York. The Marshall & Huschart Machinery Company, 62 South Canal street, Chicago, Ill., they advise us, have been appointed the exclusive agents for the Royersford punch and shear in Illinois, Michigan, Wisconsin, Indiana and Ohio, except the city of Cleveland.

The Diamond Drill & Machine Company, Birdsboro, Pa., advise us that they expect to get their new gray iron foundry, to replace that recently destroyed by fire, completed in about three months. They are at present making iron castings in the building of their new steel casting plant, the buildings for the latter being practically completed, and the furnaces built, they will probably be in a position to produce steel castings by November 1. The various departments of their plant are busy, a large quantity of work for the open hearth furnaces of the Alan Wood Iron & Steel Company is being furnished, and they have just booked a contract for skelp mills for the Sharon Steel Company.

The Philadelphia office of the Gruson Iron Works are located in Room 1103 Penn Square Building.

The Warren department of the National Tube Company, at Warren, Ohio, which has been idle for some time, is to be dismantled. The better part of the equipment of the plant will be removed to other works owned by the National Tube Company.

## The New York Machinery Market.

NEW YORK, August 6, 1902.

It is apparent that machinery merchants in general and particularly the machine tool trade were very much gratified and not a little surprised when they reviewed the business of the month of July. All machinery dealers who have figured out last month's business and compared it with previous months declare that it surpassed their expectation in showing a considerably better total than June. One prominent machinery merchant went so far as to state that last month was the best in the history of the concern.

Such a condition of affairs, despite the recent advances in prices, is truly most satisfactory. It supports the statements made in the trade to the effect that buyers were not holding off on account of the higher prices. The trade has now settled down to the new condition brought about by the raising of prices, and all fears and apprehension expressed a short time ago have faded away entirely. One of the great lights of Liberty street, who is a confirmed optimist and most successful merchant, said yesterday: "People don't buy machine tools as luxuries, they buy them when they have to, and these are such times, for everywhere plants must be increased in capacity to meet the wonderful demand."

Another well-known party in the trade, an officer of the Niles-Bement-Pond Company, said: "Demand is certainly keeping up marvelously. Our shops are all booked about 25 per cent. beyond their capacity, and during the last two years we have increased our plants about one-third." The Pond works, he said, had been just doubled, as had also the Philadelphia Engineering Works, where the Niles crane is now being built. Special efforts are now being made to bring up the productive capacity of the Pratt & Whitney shops. The small tool department is now being doubled in size. The machinery department is also to be increased materially by the building of a four-story extension over a space about 700 feet long.

Two concerns who were not represented at the meetings held at New York and Niagara Falls have followed suit and advanced their prices 10 per cent. One of these concerns produces lathes and the other shapers.

There were no important or especially large machine tool orders placed during the week. Two good sized boiler orders, which the trade have been following for some time, were placed. Both were awarded to the Babcock & Wilcox Company. Each order calls for a little over 3000 horsepower of water tube boilers. One of the installations is for the addition to the Newark plant of the North Jersey Traction Company. The other is for the Secaucus plant of the Jersey City, Hoboken & Paterson Street Railway.

Several additional orders were placed for the mechanical equipment of the power station of the New York subway. The Cleveland Crane & Conveying Company received an order for 18 20-ton and two 10-ton hand cranes. The Wheeler Condenser & Engineering Company received an order for nine feed water heaters, and the Henry R. Worthington branch of the International Steam Pump Company received an order for nine boiler feed pumps. An order for five masonry stacks, each 17 feet diameter, inside, and 250 feet high, was awarded to the Alphons-Custodis Chimney Construction Company. The contract for the coal and ashes handling and conveying machinery has not been awarded as yet.

The Copper Queen Mining Company of Arizona awarded contracts for a 4000 horse-power boiler plant. The boiler order went to the Sterling Company. The Green Fuel Economizer Company of 74 Cortlandt street received an order for economizers to be operated in connection with the plant. Another order for a 120 kw. dynamo was awarded to McClave, Hamilton & Co. by Runkel Brothers, who are adding to their factory at 531 West Thirtieth street, New York.

The Otis Elevator Company have received an order from the Manhattan Railway Company for four heavy electric passenger elevators equipped with magnet controlling devices to be installed in the new station at 110th street, near Eighth avenue, New York. Each of these elevators will have a maximum lifting capacity of 3300 pounds and a speed of 300 feet per minute. The travel of each car will be 60 feet. They have also received an order from the General Electric Company for seven complete electric elevators, with Otis motors and controllers, for installation in the shops at Schenectady. The company report orders received during last week for 51 electric elevators and 15 hydraulic elevator equipments.

The Chesapeake Development Company of Baltimore, Md., organized with a capital of \$1,500,000, for the purpose of reclaiming the overgrown timber lands of southern Maryland, are about to begin a campaign against trees, stumps, undergrowth, &c., with the view of converting the lands into first-class farming and trucking farms—the timber is to be utilized for railroad ties, lumber and fuel wood; machines will be wanted to economically cut this wood. The company's fall and winter work will be carried forward vigorously, so as to get the land in proper condition by early spring for cultivation.

It is the intention of the company to use the most approved portable saw mills and other machines to further their work. James E. Brady, Baltimore, Md., the treasurer of the company, is desirous of hearing from builders of portable saw mills.

On August 14 bids will be opened by H. C. Payne, Second Assistant Postmaster General, Washington, D. C., for the performance of mail service by pneumatic tubes and other similar devices at the following cities: Boston, Brooklyn, New York, St. Louis, Philadelphia, Washington, D. C., and Chicago. This work will necessitate the installation of several good sized air compressor plants.

Following are the bids opened last week by the Bureau of Supplies and Accounts, Navy Department, for machinery supplies for the Boston and Portsmouth navy yards.

### Boston.

- Bidder 1. The Fairbanks Company, New York City.  
 2. Niles Tool Works Company, Hamilton, Ohio.  
 3. Montgomery & Co., New York City.  
 4. Prentiss Tool & Supply Company, New York City.  
 5. Hendey Machine Company, Torrington, Conn.  
 6. Bigelow & Dowse, Boston, Mass.  
 7. W. H. Foster, New York City.  
 8. Cuyler & Mohler, Baltimore, Md.  
 9. Springfield Machine Tool Company, Springfield, Ohio.  
 10. Drew Machinery Agency, Manchester, N. H.  
 11. Manning, Maxwell & Moore, New York City.  
 12. Garvin Machine Company, New York City, informal; no guarantee.  
 13. Becker-Brainard Milling Machine Company, Hyde Park, Mass.  
 14. Hill, Clark & Co., Boston, Mass.  
 15. Brown & Sharpe Mfg. Company, Providence, R. I.  
 16. Francis Harral, New York City.  
 17. Curtiss & Curtiss Company, Bridgeport, Conn., informal; no guarantee.
- Class 1. One double punch and shear, motor driven.—Bidder 10, \$2675; 7, \$2700; 2, \$2790; 11, \$2910; 4, \$4000; 14, \$4000.  
 Class 2. Two single punches or shears, motor driven.—Bidder 10, \$2860; 2, \$4070; 7, \$4120; 11, \$4270; 4, \$4500; 14, \$4500.  
 Class 3. One open throat plate and bar shear.—Bidder 7, \$4325; 2, \$4740; 11, \$4850.  
 Class 4. One 25-inch upright drill press.—Bidder 11, \$3050.  
 Class 5. One horizontal boring and milling machine.—Bidder 4, \$1825; 11, \$2025; 2, \$2550.  
 Class 6. One plain milling machine.—Bidder 13, \$1760; 15, \$1866; 11, \$1100.  
 Class 7. One shaper.—Bidder 5, \$925; 11, \$1475.  
 Class 8. Four engine lathes.—Bidder 1, \$2792; 11, \$2490; 9, \$2684; 4, \$2776; 5, \$2960.  
 Class 9. One pipe threading and cutting machine.—Bidder 3, \$1600; 10, \$1635; 2, \$1664; 11, \$1670; 8, \$1724.  
 Class 10. One 35-inch single plate planer.—Bidder 2, \$7500; 11, \$8950; 7, \$9250.  
 Class 11. One 50-inch swing engine lathe.—Bidder 2, \$3950 and \$4950; 11, \$4125.  
 Class 12. A long list of miscellaneous hardware.—Bidder 6, \$2646.96; 16, \$3291.79; 3, \$3437.81.

### Portsmouth.

- Bidder 1. Graton & Knight Mfg. Company, Worcester, Mass.  
 2. Rahn-Meyer-Carpenter Company, Cincinnati, Ohio.  
 3. The Fairbanks Company, 416 Broome street New York City.  
 6. Springfield Machine Tool Company, Springfield, Ohio.  
 7. Manning, Maxwell & Moore, 85 Liberty street, New York City.  
 8. Niles Tool Works Company, Hamilton, Ohio.  
 11. James Clendenin, Box 1002, Baltimore, Md.  
 12. Detrick & Harvey Machine Company, Baltimore, Md.  
 13. H. M. Storms, New York City.  
 14. Garvin Machine Company, Spring and Varick streets, New York City, informal; no guarantee.  
 15. Bement, Miles & Co., Twenty-first and Callowhill streets, Philadelphia, Pa.  
 17. Drew Machinery Agency, Manchester, N. H.
- Class 1. Leather belting.—Bidder 1, \$122.32; 13, \$148.26; 17, \$176.13.  
 Class 3. One universal radial drill.—Bidder 7, \$1650; 15, \$3000.  
 Class 4. One single bolt cutting machine.—Bidder 7, \$665 and \$690; 17, \$617.34 and \$760; 8, \$688; 12, \$717.98; 5, \$807.21.  
 Class 5. One shaping machine.—Bidder 6, \$300; 8, \$275, \$270 and \$310; 7, \$435 and \$450; 5, \$448.  
 Class 6. Four 28-inch screw cutting engine lathes.—Bidder 2, \$3332.80; 5, \$3592; 7, \$3980 and \$4000; 8, \$5640 and \$5440.  
 Class 7. One universal brass lathe.—Bidder 8, \$480; 7, \$545, \$575 and \$635; 5, \$624; 6, \$735.

A. W. Gump & Co. of Dayton, Ohio, have just issued a new list of second-hand machinery tools, belting, &c., which they now have on hand. The list includes over 100 machine tools of prominent makes and of every type. It also covers a number of pumps and blowers, considerable bicycle machinery and miscellaneous tools, such as cutters, die holders, lathe dogs, pulleys, vises, chucks, &c. Announcement is also made of the fact that the company have purchased the entire contents of the Shelby Cycle Mfg. Company's plant, and having screw machines, punch presses, lathes and automatic machinery which is idle at present, they are in a position to take contract work in quantities at low prices.

**Information Wanted.**—Who makes sling chains of Tobin bronze, 9 feet long and capable of carrying 4000 pounds?

At a meeting of the stockholders of the Sharon Steel Company, held at Sharon, Pa., on Saturday, August 2, it was decided to increase the capital stock from \$5,000,000 to \$6,000,000. The proposed increase is to provide funds for large additions which are under way and which include two new blast furnaces, four open hearth steel furnaces, skelp and tube mills.



### Southern Machinery Dealers.

The recently formed Southern Supply and Machinery Dealers' Association have elected the following officers and Executive Committee:

President, C. B. Jenkins, the Cameron & Barkley Company, Charleston, S. C.  
First vice-president, Levin Joynes, Southern Railway Supply Company, Richmond, Va.  
Second vice-president, Geo. R. Lombard, Lombard Iron Works & Supply Company, Augusta, Ga.  
Secretary-Treasurer, C. B. Carter, 117 Gay street, Knoxville, Tenn.

#### EXECUTIVE COMMITTEE:

A. Morris Carey, Carey Machinery & Supply Company, Baltimore, Md.  
J. A. Riechman, the Riechman-Crosby Company, Memphis, Tenn.  
S. Milnor Price, the Henry Walke Company, Norfolk, Va.  
John G. Christopher, John G. Christopher, Jacksonville, Fla.

Standing committees have been appointed as follows:

#### TRANSPORTATION:

J. C. Greenfield, Atlanta Supply Company, Atlanta, Ga.  
R. L. Woods, Livermore Iron & Supply Store, Memphis.  
Thos. G. Hyman, Hyman Supply Company, New Bern, N. C.

#### MANUFACTURERS:

It. Bee Lebby, the Bailey-Lebby Company, Charleston, S. C.  
J. G. Doon, the Fairbanks Company, Baltimore, Md.  
A. D. Schofield, J. S. Schofield's Sons Company, Macon, Ga.

#### GRIEVANCE:

O. M. Reynolds, Anniston Supply Company, Anniston, Ala.  
Geo. V. Denny, Georgia Supply Company, Savannah, Ga.  
Peter E. Blow, Southern Brass & Iron Company, Knoxville.

The membership of the organization now includes 22 well-known Southern machinery and supply houses. They are:

Anniston Supply Company, Anniston, Ala.  
John G. Christopher, Jacksonville, Fla.  
Atlanta Supply Company, Atlanta, Ga.  
Cotton States Belting & Supply Company, Atlanta, Ga.  
Lombard Iron Works & Supply Company, Augusta, Ga.  
J. S. Schofield's Sons Company, Macon, Ga.  
Georgia Supply Company, Savannah, Ga.  
Carey Machinery & Supply Company, Baltimore, Md.  
The Fairbanks Company, Baltimore, Md.  
Southern Brass & Iron Company, Knoxville, Tenn.  
E. C. Atkins & Co., Memphis, Tenn.  
Livermore Iron & Supply Store, Memphis, Tenn.  
The Riechman-Crosby Company, Memphis, Tenn.  
Hyman Supply Company, New Bern, N. C.  
N. S. Fulford Hardware Company, Washington, N. C.  
The Bailey-Lebby Company, Charleston, S. C.  
The Cameron & Barkley Company, Charleston, S. C.  
Smith-Courtney Company, Richmond, Va.  
Southern Railway Supply Company, Richmond, Va.  
Mayer & Co., Norfolk, Va.  
The Henry Welke Company, Norfolk, Va.  
Gibbens & Stream, New Orleans, La.

### Iron and Industrial Stocks.

In some of the iron stocks there was a considerable movement during the past week. Cambria has been quite active and on Tuesday sold up to 26 $\frac{1}{4}$ , ex-dividend. The Fuller Consolidation issues continued strong, selling as high as 62 for the common, while Monday the preferred was off to 106 to 106 $\frac{1}{2}$ . The latest reports concerning the car companies is that the proposed consolidation of the Pressed Steel and the American companies has been definitely abandoned. On the other hand, there are rumors that the Republic Iron & Steel Company are to absorb the Sloss-Sheffield Company. The common of the latter jumped to 42 on Tuesday. The United States Steel stocks were quiet.

The June 1 balance sheet of the Central Coal & Coke Company shows assets of \$10,979,682, of which \$5,364,107 is credited to coal lands. The undivided profits are \$108,110.

The annual meeting of the stockholders of the Westinghouse Electric & Mfg. Company of Pittsburgh will not be held until George Westinghouse returns from Europe, which will be some time in August or early in September.

**Dividends.**—The Norton Iron Works of Ashland, Ky., have declared a 15 per cent. quarterly dividend, making 50 per cent. paid in cash by this concern since November 1, 1901.

The American Radiator Company have declared a regular quarterly dividend of 1 $\frac{1}{4}$  per cent. on the preferred stock, payable August 15. Books close August 10 and reopen August 15.

The galvanizing and barb wire departments of the Pittsburgh Steel Company, at Monessen, Pa., have been started up and some excellent records for output and quality of product have already been made in these departments. The wire nail department is about ready for operation and will be started in a short time. The field fencing department will be started this week and will have a capacity of 200 tons a day. The buildings and machinery for the rod mill are on the ground, but the rod mill will not be started for some little time.

### New York.

NEW YORK, August 6, 1902.

**Pig Iron.**—Continued buying for delivery during the early part of 1903 is reported, but in some instances negotiations are dragging because buyers are inclined to hold out for lower prices. A good deal of Foreign Pig Iron is being offered, and there is quite some competition among dealers for importation. Scotch Pig is being offered at \$20 to \$23, the higher price being demanded for special brands. Middlesborough No. 3 is quotable at \$18.75 to \$19. For spot lots of Scotch Iron considerably higher prices are asked and obtained. For delivery in 1903 the following quotations are made: Northern Iron, at tidewater, No. IX, \$22.75 to \$24.75; No. 2 X, \$21.75 to \$22.75; No. 2 Plain, \$20.75 to \$21.75. Tennessee and Alabama brands, in New York and vicinity, No. 1 Foundry, \$22 to \$23; No. 2 Foundry, \$21.25 to \$22; No. 3 Foundry, \$20.75 to \$21.25. Foreign Ferromanganese is offered at \$51 to \$51.50, delivered.

**Steel Rails.**—It is reported that the Southern and Union Pacific companies who have been in the market for some time for jointly 100,000 tons of Steel Rails, have purchased about 30,000 tons from a German maker for Pacific Coast delivery. We continue to quote \$28, at Eastern mill, for Standard Sections.

**Finished Iron and Steel.**—The market continues active for Structural Material and prices are firm. We quote at tidewater as follows, but for small lots and prompt delivery much higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c.; Sheared Steel Plates are 2c. to 2.10c. for Tank; 2.10c. to 2.20c. for Flange; 2.25c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.95c. to 2.10c.

The American steel foundries, of which F. E. Patterson, formerly manager of the American Steel & Wire Company, is the secretary and treasurer, have opened offices in the Arthur Building, 74 Broadway, New York.

### Metal Market.

NEW YORK, August 6, 1902.

**Pig Tin.**—Until yesterday the market was quiet and unchanged. The nonarrival of steamers which were expected gave the speculative element at the Metal Exchange an opportunity for bidding prices up, and they did it. They succeeded in pulling spot up to 28.85c. Up to that time only 60 tons had arrived, while 965 tons were due. This morning a steamer bearing 365 tons arrived and prices fell. On 'Change they were offering this cargo at 28.55c., ex-dock. There were no sales. The activity on the Metal Exchange was purely the work of the speculative element and had no bearing on general trade, which is still quiet. The ruling quotations at this writing are: Spot, 28.60c. bid; 29c. asked; August, 28.15c. to 28.30c.; September, 27.75c. to 28.15c.; October, 27.50c. to 27.85c. The London market is quiet. The spot quotation is unchanged from last week at £127 10s., and futures are 2 shillings 6 pence lower, at £125 10s.

**Copper.**—The market is very quiet and still in buyers' favor. Prices are practically unchanged from last week, but the tone of the market is easier. Prices here are as follows, delivery spot to December: Lake, 11.75c. to 11.95c.; Electrolytic, 11.75c. to 11.82 $\frac{1}{2}$ c.; Casting, 11.15c. to 11.60c. The London market fluctuated slightly, but closed showing a decline as compared with last week. London closed £52 12s. 6d. for spot and £52 16s. 3d. for futures; Best Selected, £56 15s, a decline of 5 shillings from last week. Following are the semiannual United States Copper statistics as published by the New York Metal Exchange, and compiled in gross tons by C. Mayer, secretary:

SUPPLIES.				
	1902.	1901.	1900.	1899.
Domestic production for the six months ending June 30.....	140,448	133,394	134,577	124,487
Imports for the six months ending June 30.....	29,737	26,631	20,066	13,908
Totals.....	170,185	160,025	154,643	138,395
SHIPMENTS.				
	1902.	1901.	1900.	1899.
For the six months ending June 30.....				
To Europe.....	94,641	49,325	85,322	51,723
British North America.....	569	367	386	220
Mexico.....	58	62	81	50
Contents of sulphate of copper.....	3,238	5,123	3,829	1,010
Totals.....	98,506	54,877	89,618	53,903
HOME CONSUMPTION.				
	1902.	1901.	1900.	1899.
Deducting shipments from supplies, there were apparently left for home consumption for the six months ending on June 30.....	71,679	105,148	65,025	84,492

Using these figures as a basis it will be seen that at the beginning of this year there was a visible supply in this coun-

try of 135,000 gross tons. This includes the production up to the end of the year, and it should be considered that as so large a percentage of the production is now treated by the Electrolytic process, two months' production should be considered as in treatment and in transit. The production of the first six months of this year was 140,448 tons, and the importations 29,737 tons, a total of new supplies of 170,185 tons. This added to the visible supplies would make 305,185 gross tons. There were exported in the first six months 98,506 tons, and with the American consumption figured at 108,000 tons, the total amount of metal taken out would be 206,506 tons, leaving a visible supply of 98,679 tons on July 1. It will, therefore, be seen that 36,321 tons were taken out of the visible supply during the first six months of this year. Since July 1 the exports have fallen off considerably, and with the increased production going on and the heavy importations from Mexico and British North America it is figured that the month of July showed an accumulation of from 5000 to 6000 tons. Several parties in the trade hold that as Europe has been filled up during the first half of this year and with the production still increasing, it is fair to presume that there will be a further accumulation during the balance of this year, and that the first of next year may bring the visible supply to about the same figure as at the beginning of this year.

**Pig Lead**—Is entirely unchanged. The Smelting & Refining Company are still quoting 4.12½c. for spot, and 4.10c. futures. The London market has declined a shade to £11 1s. 3d.

**Spelter**—Is firm, spot being held at 5½c. here. St. Louis is quoted 5.20c. The London market has declined to £18 15s.

**Antimony**—Cookson's has declined ¼c. to 10c. Hallitt's is unchanged at 8c., and other brands are still quoted 7½c.

**Nickel**—Has declined somewhat. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

**Tin Plates**—This market is unchanged. The American Tin Plate Company are quoting for delivery up to December 1 on a basis of \$4.19 per box of Standard 100-lb. Cokes, f.o.b. New York, or \$4, f.o.b. Pittsburgh district. Quotations from Swansea are unchanged at 13 shillings 3 pence.

### July Fluctuations in Iron Stocks.

The following table shows the extent of transactions and the fluctuations in quotations of the stocks of iron and steel companies in the month of July, with the dates on which the highest and lowest prices on each stock were realized:

Cap'l issued.	Sales.	High-est. July.	Low-est. July.
\$17,701,500 Am. Bicycle Co., com.	8,400	7½	31 5½
9,294,900 Am. Bicycle Co., pref.	4,300	21	1 18
9,500,000 Am. Bicycle Co., bonds	92,000	66	21 63
41,233,300 Am. Can, com.	4,329	12½	21 10½
41,233,300 Am. Can, pref.	5,884	55	2 52½
29,000,000 Am. Car & F'dry, com.	22,200	33½	19 31½
29,000,000 Am. Car & F'dry, pref.	9,250	93	19 89½
24,106,000 Am. Loco., com.	17,200	33½	21 31½
25,000,000 Am. Loco., pref.	6,470	96	2 93
15,090,000 Bethlehem Steel.....			
45,000,000 Cambria Steel.....	82,210	27½	31 24½
7,000,000 Centr. Foundry, com.	2,100	2½	21 2
7,000,000 Centr. Foundry, pref.	2,565	13	24 11
17,000,000 Col. Fuel & Iron.....	185,700	102½	20 88½
25,000,000 Crucible Steel, com.	4,810	21½	1 21
25,000,000 Crucible Steel, pref.	7,987	86	8 85
1,975,000 Diamond St. Steel...	2,341	1½	22 1½
2,368,100 Empire I. & S., com.	200	11	1 10
2,281,400 Empire I. & S., pref.		50	1 49½
10,000,000 Geo. A. Fuller, com.	190,400	64	24 49
5,000,000 Geo. A. Fuller, pref.	42,600	108	31 94½
15,000,000 Inter. Pump, com.	4,300	54½	23 52
8,850,000 Inter. Pump, pref.	1,200	92½	11 90
11,000,000 International Silver...	18,100	15	24 12½
8,396,000 Natl. Enam., com.	350	30	21 27
15,441,800 Natl. Enam., pref.	75	86½	25 84
4,449,800 Otis Elevator, com.	6,520	40	11 32
6,350,000 Otis Elevator, pref.	260	105	2 102
10,750,000 Pa. new, com., Phila.	1,559	43½	22 37
16,500,000 Pa. new, pref., Phila.	4,616	100	22 90
12,500,000 Pressed Steel, com.	18,900	48½	11 45
12,500,000 Pressed Steel, pref.	8,900	88	24 85
10,000,000 Railway Spr., com.	16,710	32½	24 30½
10,000,000 Railway Spr., pref.	8,900	88½	24 85
27,191,000 Rep. I. & S., com.	33,600	19½	31 17
20,306,900 Rep. I. & S., pref.	21,230	77	31 72½
7,500,000 Sloss-Shef. S. & I., com.	1,600	39	31 32
6,700,000 Sloss-Shef. S. & I., pref.	600	83	31 82
20,000,000 Tenn. Coal & Iron.....	99,800	69½	25 62
1,500,000 Tidewater Steel.....	870	7	9 5½
12,106,000 U. S. C. Pipe, com.	7,500	12½	25 11
12,106,000 U. S. C. Pipe, pref.	5,000	47	28 43½
510,361,300 U. S. Steel Co., com.	392,650	41	19 37½
508,511,200 U. S. Steel Co., pref.	282,735	92½	17 88½
8,425,000 Virg. Iron & Coal, com.	2,150	12½	29 11½
10,000,000 Virg. I. & C. 5% bonds	88,000	60	29 56
1,500,000 Warwick I. & S.....	4,933	7	1 6½

Richard Garlick has been made auditor of the Youngstown Iron Sheet & Tube Company, Youngstown,

Ohio, succeeding W. C. Reilly, recently appointed general superintendent. Mr. Garlick is also treasurer of the concern.

### American Steel Foundries Company.

The American Steel Foundries Company were permanently organized last week and Joseph E. Schwab, a brother of C. M. Schwab, president of the United States Steel Corporation, was elected president. The president of the Steel Foundries Company has been associated with the United States Steel Corporation since their organization as assistant to the president. The other officers elected are Daniel Eagan, first vice-president; Clarence H. Howard, second vice-president; F. E. Patterson, secretary and treasurer; Max Pam, general counsel, and Jones, Caesar & Co., auditors.

The first vice-president was president of the American Steel Castings Company, a subsidiary concern of the consolidated company.

The directors follow: Joseph E. Schwab, president; Eben B. Thomas, chairman, Erie Railroad; William C. Brown, vice-president, New York Central; J. M. Schoonmaker, vice-president, Pittsburgh & Lake Erie; Alfred Clifford, director, United States Steel Corporation; S. R. Callaway, president American Locomotive Company; William K. Bixby, chairman American Car & Foundry Company; Max Pam; Leslie D. Ward, vice-president Prudential Life Insurance Company; Edward Shearson, Shearson, Hammill & Co.; Charles Miller, president Galena Oil Company; Lewis Nixon, president United States Shipbuilding Company; Daniel Eagan; George B. Leighton, president Leighton & Howard Steel Company; E. F. Goltra, president American Steel Foundry Company; Clarence H. Howard, vice-president Leighton & Howard Steel Company; W. D. Sargent, president National Brake Shoe Company; Arthur J. Eddy, Howard K. Wood, Kenneth K. McLaren and Donald H. Mann.

The Executive Committee is made up as follows: Joseph E. Schwab, chairman; Daniel Eagan, E. F. Goltra, George B. Leighton, Eben B. Thomas, Clarence H. Howard, Max Pam.

It is expected the securities of the company will be listed on the New York Stock Exchange within a short time.

The American Steel Foundries Company were incorporated under the laws of New Jersey on June 16 last with an authorized capital stock of \$20,000,000 in 6 per cent. cumulative preferred stock and \$20,000,000 common. There has been issued for the properties taken over and for all additional cash working capital \$15,500,000 preferred and \$15,000,000 common stock.

All of the remainder of the stock will remain in the treasury for the future purposes of the company, and none will be issued except for cash or property of the actual cash value at par.

Plant owners declined to take any cash in payment for their properties, but instead took stocks of the company, therefore cash requirements have been considerably reduced. The deal was carried through without any underwriting privileges.

The American Steel Foundries Company are a combination of practically all the prominent steel foundries of the country.

It includes the American Steel Castings Company of New Jersey, which embraces several plants in Pennsylvania and Ohio; the Reliance Steel Casting Company, Limited, of Pittsburgh; the Leighton & Howard Steel Company, St. Louis; Franklin Steel Casting Company, Franklin, Pa.; the Sargent Company, Chicago, and the American Steel Foundry Company, St. Louis.

✓ **The Sharon Steel Company.**—The new tube skelp and sheet mills of the Sharon Steel Company at Sharon, Pa., are being erected as fast as possible, but will not be in operation before about December 1. The sheet mill will have an annual output of about 35,000 tons and will contain ten mills, ten sheet furnaces, ten pair furnaces and four annealing furnaces. There will also be a galvanizing plant connected with the sheet mill.



# HARDWARE.

**T**HE reports from all sections of the United States—East, West, North and South—published in our last issue, are a valuable compilation of information, drawn simultaneously from the Hardware trade, largely from retail merchants. These reports, coming from 45 States and Territories, filled 36 closely printed columns. They were not only voluminous and comprehensive, but may quite safely be accepted as correctly setting forth the condition of trade as observed by each writer, who could certainly have no incentive for either overdrawing or understating it. The perusal of this data shows with only occasional exceptions that exceedingly favorable reports are now being made by a class of conservative and often hard-headed business men who come in constant contact with those important factors of our national economy, the farmer and artisan. The practical unanimity of testimony from such widely distributed sources, covering such an immense territory, is particularly valuable in so far as it enables manufacturers and merchants desirous of doing business on reasonably safe lines to forecast the future.

While there are allusions to a lack of rain in some sections and to a profusion of it in other parts, the same theme seems to pervade all the contributions—namely, that crops in the main are excellent and that the farmer is exceedingly prosperous. For a long series of years “prosperity,” whenever it came, applied more particularly to the industrial part of the community—that is, to the mechanic, the factory and mill worker, the railroad employee, &c. The poor farmer seemed to get a discouragingly small proportion of the good things. But now, with largely enhanced prices for his products, he appears to thoroughly appreciate his good fortune and is making a proper disposition of the proceeds in the way of freeing his farm from the burden of debt and making improvements which operate to the benefit of neighboring merchants and artisans.

This introduces another line of thought which in the exuberance of present rejoicing may be overlooked. The lesson of Joseph in Egypt making provision in the seven years of plenty for what he knew, from an undisputed source of accurate information, would be followed by an equal period of pinching famine, should influence cautious men to set aside from the plenty of to-day something for the less favorable years, an average of ten years, perhaps, determining better the ratio of real prosperity. Some optimistic individuals have actually said that we probably would not have another season of depression in 50 years, but the history of the country, if that is any guarantee for the future, does not warrant such belief. It is a fair inference that the recent consolidations of great interests may serve as a tempering and modifying influence in time of unreasoning panic for which there may be no sufficient cause, in somewhat the same way that the New York Clearing House has repeatedly steadied the country since its organization in 1853. What has happened in such cases has been the getting together quickly of the important committees of this association of great banks, and, in an emergency, issuing certificates current among themselves for clearing purposes, loaned as needed to any solvent bank on approved collateral at legal interest.

What has thus been done by one group of thoroughly practical, broadminded, well informed business men for the protection of great financial interests is per-

haps possible under the new conditions by the group of industrial giants who represent manufacturing enterprises. Many important industries are now so centralized that their responsible officers can be quickly assembled and act promptly in an emergency, being powerful enough to command respect. This must not be interpreted as meaning that the effects of reckless inflation and overcapitalization can be hastily remedied, but with very far reaching sources of information executives are in a position to stand firm against spasmodic panics, such as that which followed President Cleveland's Venezuelan message, the Northern Pacific corner of last year, and other similar scares, which were quickly nipped in the bud by interests in a position to know that there was no reasonable foundation for panic. Nevertheless, whether this theory will work out in practice or not, it should not prevent any who prefer to have their living of an even character, rather than plenty now and scarcity hereafter, from getting an anchor to windward in the form of canceled debts and cautious investments.

Another point brought out is that the billion dollar and other consolidations are not absolutely conscienceless, as, according to some of the correspondents, they have been instrumental in steadying prices in various staple commodities in the face of an extraordinary demand, one somewhat mollified writer going so far as to say that this unlooked for attribute “had taken some of the curse off of them.”

There are many other points touched upon in this mass of advices that will afford substantial food for reflection, mainly because they are from people who are thoroughly conversant with what they are talking about, while the fact that they have been written almost simultaneously makes them especially safe for purposes of comparison.

## Condition of Trade.

Midsummer conditions continue to govern nearly all branches of the Hardware trade. The vacation season is seldom a time for great activity. Nevertheless, a few noteworthy features are observed, the most important of which is that large buyers are again beginning to place orders for Shelf Hardware. They have for some time refrained from making purchases, waiting to see how manufacturers would stand the test of the summer. But finding no indication of weakness, and realizing that if they are to get goods for their fall trade they will have to order them soon they are entering the market. While jobbers and retailers are believed to be carrying larger stocks of goods than for many years, yet these stocks are not equally distributed through the entire line, as in some branches of trade manufacturers are still in arrears in filling their orders, although working to their full capacity. It has been the experience of all Hardware merchants for several years that the supply of seasonable goods has fallen considerably short of the demand. Every successive season through this period of prosperity they have laid in larger stocks in the expectation of satisfactorily meeting their customers' requirements, only to encounter the same discrepancy between their supply and the demand, due to the steadily increasing consumption of the country. It remains to be seen whether this year the extent of the fall trade has been measured accurately or whether a shortage will again be experienced. The fine outlook for the crops inspires a widespread belief that trade will be greater than ever and that again it will be found that not enough goods were made up in advance.

**Chicago.**

(By Telegraph.)

While no special animation has marked the Hardware trade of the past week, a fair volume of business has been handled for this season of the year, and notwithstanding the strike which delayed business for several days during July, the records of most dealers for the entire month show a substantial increase compared with July, 1901. There is little in the character of trade now being experienced to call for special comment, other than that some jobbers are making unusually early shipments of fall goods, and not only are Stove Boards, Elbows, Coal Hods and such articles selling well, but liberal orders for Ammunition and Cutlery have been received during the past few days. The demand for Carpenters' Tools in general is declining somewhat, as usual at this time of year, but there are a few articles which it is difficult to obtain in sufficient quantities to meet the demand. One feature of interest, although of no special significance, is the continued demand for Wire Cloth. In certain specialties, as, for instance, Refrigerators, Mowers, &c., manufacturers' agents are meeting with encouragement—that is, so far as the booking of orders for next year's delivery is concerned. Manufacturers' agents for lines of Builders' Hardware report the month of July much in advance of the corresponding month a year ago, but new orders are less plentiful at the present time, although still above the average at this season. Dealers in Heavy Hardware are complaining of the light demand for Wagon Bolts and Nuts, Rims, Tires, Spokes, &c., which is resulting from the unusually wet weather experienced during June and July, but notwithstanding these complaints some encouraging orders have been recently received for these goods. The demand for Spikes and Washers has been unusually active. Nails, both Wire and Cut, have been slow but steady. It developed at the meeting of the Independent Nail manufacturers, who met at Chicago last week, that nearly all the mills are running single turn. To this is credited the unusually stable market during the summer. In Wire, both Barbed and Plain, there has been a moderate movement without essential change in prices. The demand for Screws is improving. Manufacturers' agents have been obtaining some liberal contracts from the Northwest during the week.

**St. Louis.**

(By Telegraph.)

The movement of all goods is increasing and trade looks most encouraging for the future. July, while not an exceptional month in volume of business, was marked by a very good demand in certain lines. One large jobber reports for that month the largest call in the history of the establishment for Shelf Hardware and Sporting Goods. The fruit crops are not equal to those of the past few years, and the fact is noticeable in the curtailment of the demand for Preserving Kettles, Fruit Jars and other supplies. Builders' Hardware continues in good demand for local operations, and an increase in this branch of trade is expected.

**Boston.**

BIGELOW & DOWSE COMPANY.—Two months of summer have passed and the oldest inhabitant cannot remember a season when the weather has been so cold or when the rainfall has been so excessive. Usually before August the fields and lawns are brown and dry and the foliage covered with dust. This year everything is green and bright as in early spring. The past week the summer hotel keepers are rejoicing at the return of sunshine and warm weather and see a chance of making up the losses of the earlier season. Nature seems to have been waiting for the sunshine, too, for corn has grown 2 feet in the past week. If the seasonable weather continues all farm products will show a large yield.

Trade, like the weather, has had its ups and downs and it is an exception where a business will show an increase over that of last year. Nevertheless, every one is hopeful for a good fall trade, as the factories are busy and labor is well employed.

Prices of all kinds of Hardware are firm and the present indications are for advances, rather than for declines.

**New Orleans.**

A. BALDWIN & Co.—Beneficial rains in all sections of the lower country have opened up business in very good shape and the orders are beginning to come in freely. For a few weeks back it has been somewhat quiet owing to the continuous drought, but the merchants are feeling much better and are anticipating their wants and buying large and assorted orders.

Prospects are exceptionally good for a very heavy fall trade.

**San Francisco.**

PACIFIC HARDWARE & STEEL COMPANY.—It seems difficult at this end of the continent to find items to write you about that will be of general interest to your readers. Some years ago little was known of this coast or of California in the Eastern States, and it seems as though little interest was taken in our development. Latterly, however, we know that California is being more generally considered by people all over the United States, and, generally speaking, the people know more about our cities and products than they have ever done in the past.

It might therefore prove of some interest to know that in the present year California can point with pride to its general products. The harvest season is well advanced and everything points to very large returns. Business generally has been very good in this section, and in view of the large crops we have every reason to expect an increased business for the balance of the year, so that 1902 shall establish a new record for us. On the whole, we believe that not only California, but particularly San Francisco, is on the eve of a period of prosperity.

**Cleveland.**

THE W. BINGHAM COMPANY.—The condition of the General Hardware, Mining and Milling Supply trade in this section of the country is exceedingly good. In fact we are surprised at the large number of orders we have received by mail direct from customers this last month, as July is usually a very quiet month as far as general trade is concerned.

Our traveling men have about completed their vacations and are now coming in to brush up and get posted for the fall campaign. Everything points to a large trade this fall, as the dealers have not over bought. We seem to have had a steady and even trade, not any rush for any one particular line of goods, but the general business has been healthy, as prices have been steady and even, and merchants have not been afraid to sort up very liberally. On the whole the outlook is very encouraging.

**Philadelphia.**

SUPPLEE HARDWARE COMPANY.—The midsummer month of July is usually the month of smallest volume of sales in the year. Some years ago it became quite general in all large Eastern cities for each business man as well as all employees to take two weeks' vacation during that month, or, if that was impossible, to defer it until the month of August. During the last few years the custom has become general with trade tributary to our city, and has extended throughout almost the entire Eastern section, therefore we usually look for diminished trade during that interim.

This year we had reason to be pessimistic in regard to trade, owing to the coal strike of Pennsylvania, which has been so thoroughly discussed in the various daily papers. This continues in the same uncertain state. Unfortunately the strikers became restless, impatient and uneasy and riots occurred in one section, which, it was feared, would extend. The sheriff felt he could not control the situation and the State militia was called out by the sheriff and the Governor of the State was compelled to respond; and while quiet has been restored uneasiness still continues throughout this entire section. While it was supposed that work might be resumed August 1 in many collieries this has evidently been in-



definitely postponed. Taking it all in all, therefore, with these conditions, trade has been in excess of what one might have naturally looked for during the past month.

The past six months have been months of unusual activity in Hardware circles, and in some sections outside of the "striking district" trade has responded to the requirements made upon the dealer. The production of pig iron in our State has reached almost fabulous proportions. But a few years since it was openly stated by those who had reason to make the assertion that our country could not exceed the limit of 12,000,000 tons of pig iron before the year 1905, but the results of the last year ending July 1 show we have exceeded 17,000,000 tons; and with this output stocks were lower than desirable July 1 and thousands of tons have reached this country from abroad.

The manufacturing industries throughout our State have been taxed to their utmost, the structural iron output has been beyond precedent and something stupendous, ordinary iron has been in great demand, far beyond the ability to make prompt shipments, deliveries of steel have been delayed far beyond the date of contract; and in pig iron deliveries as well as steel we ourselves have suffered from delay in our own Lawn Mower department. There has been almost a famine of freight cars, from which we have all suffered, both in incoming and outgoing freight. The disappointment has been great to us in delays of incoming freight, and there has been great disappointment to our customers in outgoing freight reaching them.

A repetition of what we have seen during the past 12 months is more than probable during the next 12 months. Manufacturers have all felt the effects to the extent that an advance in prices of their product was unavoidable, and it should have been no surprise to those who have watched the trend of events when an advance in Hardware began, which advance continued from time to time on many goods during the entire six months. It has been essential for the jobber to enter his orders from an estimate of his possible wants for at least six months in advance of probable requirements, otherwise he would have been unable to fill orders. We ourselves have found it necessary to have a stock of at least 25 per cent. over the preceding six months.

We will leave the manufacturing industries of the country for a moment to touch on the agricultural products of the country as a whole. In this we should certainly feel very comfortable at the flattering outlook. Our wheat crop at present stands quite above the average, the cotton crop appears eminently satisfactory, and likely to enter freely into products for immediate consumption. Oats and hay show a satisfactory yield and our corn crop is something stupendous as well as unprecedented. A corn crop of 2,500,000,000 bushels is now predicted. The outlook disarms any pessimistic predictions and is certainly satisfactory for the most optimistic. The heavy rains throughout the country have in isolated cases in certain locations possibly been discouraging, but as a whole they have been an advantage. The weather has not been intolerably hot, and the health of the country has been such as to cause less anxiety and distress than our country usually feels during the summer months, or during the heated term.

Collections are fair.

#### St. Paul.

FARWELL, OZMUN, KIRK & Co.—Business has gone through July about as expected. Its volume of trade has been healthy. Prices have run along regularly in most part. Retail dealers have been buying for actual wants, and altogether the trade has been satisfactory. The harvest in the Northwest is now on, and in South Dakota, Northern Iowa, Wisconsin and the south half of Minnesota the farmers are using every energy to secure their abundant crops. The weather is favorable and if August continues so there will be a very fine crop of small grain harvested. With the exception of a part of the Red River Valley the Northwest has been generally free from severe losses by floods and droughts. There have been some hail and wind storms, but these have

been local and not on a much larger scale than usual, and if the losses already sustained be not greatly increased this month the harvest will be abundant and generally satisfactory. In the North there is a large acreage of late sown flax and wheat that will need a full month of favorable weather to mature. The outcome of this very considerable factor in the results of the year will be watched with solicitude.

The greatest source of trouble in the trade continues to be in the getting of some lines of goods, Builders' Hardware perhaps being one of the most forcible illustrations. The buyers of this line have been kept constantly in no enviable frame of mind thus far this season, and it now looks as if the balance of the year to them will prove still more aggravating. Strikes affecting building operations seem to have made no appreciable effect on the demand for these goods.

The popular belief, for which there is some justification, that higher prices for nearly everything that enters into the cost of building would largely restrict the demand, is not sustained by the conditions of the market. These factors have doubtless been influential, but there have been more powerful causes at work in the opposite direction, and the result is a remarkable demand for these goods and correspondingly depleted stocks in the hands of the jobbers, with no possible way to fill up their shelves for months to come.

#### Portland, Oregon.

CORRETT, FAILING & ROBERTSON.—This section is now in the midst of its grain harvesting, and prospect is that the harvest will be satisfactory from standpoint of quantity.

As regards prices, ship charters are helping the farmer out in the lower rates made. This week the ship "Peter Rickmer," one of the largest sailing vessels afloat, was chartered at 25 shilling, \$26,652, for cargo. In March, 1901, the same ship chartered at 40 shillings, \$42,643, a saving to wheat growers of \$16,000 in freight alone. Crops other than wheat are making satisfactory progress and the fall outlook is as bright as in any time in the past.

Oregon and Washington shipped to Africa 2,000,000 bushels of wheat and flour since January 1, more than double the amount ever shipped in an entire season of one year before. This shows how our exports are increasing. In lumber exports are far ahead of what they have been in every direction. Last month Oregon mills alone shipped 8,000,000 feet foreign.

The Union Pacific is soon to extend homeseekers' rates into this territory, so immigration will again be headed this way as in the spring. Altogether, our outlook is O.K.

#### Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—The favorable conditions that have characterized our reports for some time past on the state of trade in this trans-Missouri region still hold true; in fact, the general situation is even better. The harvest of small grains was unusually heavy, and of good quality. The weather continues propitious for ripening corn. An immense acreage of this cereal has been planted this year, and as corn is king in this section, the large yield in sight may be regarded as an assurance of an extremely heavy fall business. So far this year has been a record breaker in volume of business transacted, and with bountiful crops assured, bringing good, substantial prices, there would appear to be no reason whatever why the balance of the year should not show a heavy gain over the first half. As far as fluctuations in prices are concerned, the Hardware market is comparatively featureless. All lines appear to be in a good firm position, and with the general prosperity existing, it is likely that values will remain about where they are for some time to come.

#### NOTES ON PRICES.

Wire Nails.—There is a continued movement of Wire Nails, as the result of a demand which is fairly satisfactory for the season. The mills are making shipments promptly, but annoying delays occur on many of the railroads owing to the large demand made upon trans-

portation facilities. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.05
To jobbers in less than carload lots.....	2.10
To retailers in carload lots.....	2.10
To retailers in less than carload lots.....	2.20

*New York.*—The local movement of small lots of Nails from store is larger in proportion than the demand from nearby points. Quotations are as follows: Single carloads, \$2.20; small lots from store, \$2.25 to \$2.30.

*Chicago, by Telegraph.*—The jobbing demand has been light and shipments from the mills have been reduced, but this is not significant at this time of the year. Single lots sell at \$2.20 to \$2.25 from store.

*Pittsburgh.*—At a meeting of the independent Wire Nail mills held in Chicago last week the price of \$2.05 in carloads was reaffirmed. The manufacturers realize that to reduce the price of Wire Nails at this time would not benefit the market in the slightest, but, on the contrary, would probably have an opposite effect. There is practically no demand for Wire Nails, but it is expected there will be improvement in this respect before long. Prices are well maintained by the mills, but jobbers who have stocks of Wire Nails, bought when prices were slightly lower than they are now, are cutting prices, but only to a slight extent. When present prices of Steel and Wire Rods are taken into account there is very little room for cutting in prices of Wire Nails, and the price of \$2.05 in carloads is regarded by the trade as very conservative, and, in fact, Wire Nails are regarded as the cheapest article at the present time on the whole iron and steel list.

*St. Louis, by Telegraph.*—Light demand continues in the market for Wire Nails. Carload lots are sold at \$2.25 and small lots from stock at \$2.30.

**Cut Nails.**—On account of the high cost of iron and steel in proportion to the price obtained for Cut Nails makers who buy their material are not accumulating stocks of Nails. On the other hand, manufacturers who make their own material can sell it more profitably than if cut into Nails. There appears to be no immediate prospect of a change in these conditions. Quotations are as follows: \$2.05, base, in carloads, and \$2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

*New York.*—There is a temporary scarcity of some sizes of Flooring Nails in the local market, owing to the large demand and to delayed shipments of carloads from mill. Otherwise the demand is normal. Quotations for carloads and less than carloads are as follows: Carloads on dock.....\$2.18  
Less than carloads on dock.....2.23  
Small lots from store.....2.30

*Chicago, by Telegraph.*—The demand for both Steel and Iron Cut Nails has been quite moderate, but prices have been well sustained, stocks being in no way heavy. Small lots from store continue to sell at \$2.30 per keg.

*Pittsburgh.*—July prices of Cut Nails have been reaffirmed for August delivery. Demand is somewhat light, but there is a good deal of inquiry for Iron Cut Nails, which are scarce and bring higher prices than Steel Nails. We quote Cut Nails at \$2.05 base in carloads and \$2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination, terms 60 days less 2 per cent. off in 10 days.

*St. Louis, by Telegraph.*—A small call is reported for Cut Nails. For small lots from jobbers' stocks \$2.40 is asked.

**Barb Wire.**—The market continues unchanged, and requirements show no increase. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots.....	\$2.60	\$2.90
To jobbers in less than carload lots.....	2.65	2.95
To retailers in carload lots.....	2.70	3.00
To retailers in less than carloads.....	2.80	3.10

*Chicago, by Telegraph.*—The market has remained quiet, with only a moderate demand, but there is no

pressure to sell on the part of jobbers, and the accumulation at the mills is not important. Galvanized is selling at \$3 to \$3.20, and Painted at \$2.80 in carload lots, with 5 per cent. extra for special quality.

*Pittsburgh.*—Demand continues very light, and there is some unevenness in prices, mostly among jobbers, who seem anxious to realize on stocks of Barb Wire, which they have and which were bought at really lower prices than are ruling now. It is hoped that demand for Barb Wire will pick up before long. A number of mills remain idle, thus restricting output, which ought to have a beneficial effect on the market and prevent any further accumulation of stocks, which are already large. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; Painted, \$2.60; Galvanized, \$2.90; less than carload lots, Painted, \$2.65; Galvanized, \$2.95.

*St. Louis, by Telegraph.*—The demand for Barb Wire shows no increase in volume since our last report. Prices are unchanged, Painted at \$2.90 and Galvanized at \$3.20.

**Plain Wire.**—The tone of the Plain Wire market continues fairly strong under a moderate demand. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.00	\$2.40
To jobbers in less than carload lots.....	2.05	2.45
To retailers in carload lots.....	2.05	2.45
To retailers in less than carload lots.....	2.15	2.60

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....Base.....	\$0.40 extra.
10.....\$0.05 advance over base.....	.40 "
11......10 " " " ".....	.40 "
12 and 12½.. .15 " " " ".....	.40 "
13......25 " " " ".....	.40 "
14......35 " " " ".....	.40 "
15......45 " " " ".....	.75 "
16......55 " " " ".....	.75 "
17......70 " " " ".....	1.00 "
18......85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

*Chicago, by Telegraph.*—There has been quite an active movement in Plain Wire, especially from the mills. There has been a fair demand in a jobbing way, and prices remain steady at \$2.20 from store.

*Pittsburgh.*—No change was made in prices of Plain Wire at the meeting of the mills held in Chicago last week. Demand is moderate and the tone of the market is fairly strong, only occasional concessions being made. We quote Plain Wire at \$2 and Galvanized at \$2.40 in carloads, f.o.b. at mill, with the usual advances for small lots.

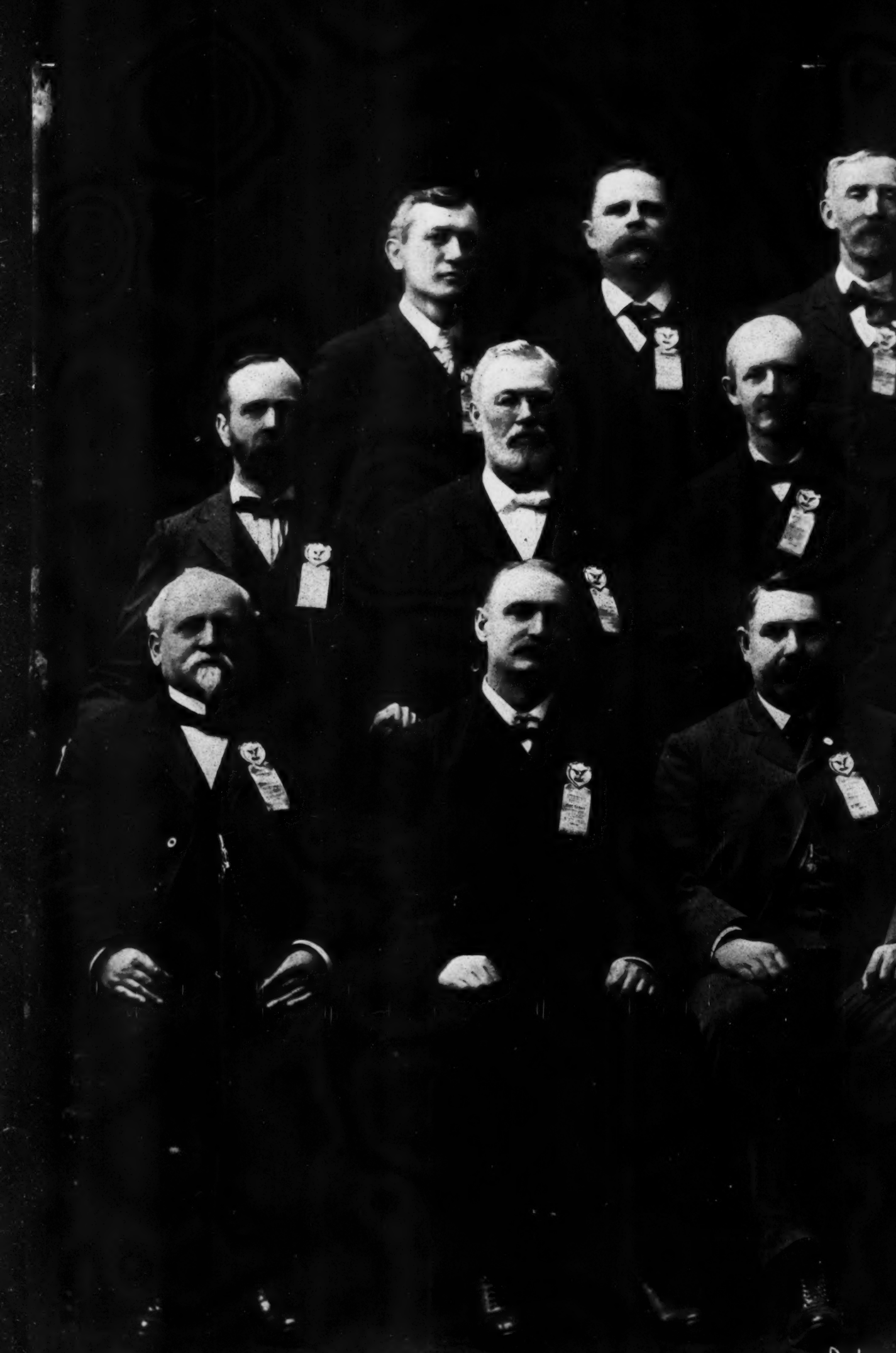
*St. Louis, by Telegraph.*—The demand for Plain Wire is of fair proportions and prices remain firm,—No. 9 at \$2.25 and Galvanized \$2.65.

**Cordage.**—The general condition of the Rope market is unchanged. Demand continues moderate, corresponding with the usual tendencies for the season. The market is represented by the following quotations: Manila Rope, 12½ to 13 cents; Sisal Rope, 9¼ to 9½ cents per pound. In view of high prices Mixed and Jute Rope is purchased to a considerable extent.

**Glass.**—The first part of August finds the Window Glass situation in a still unsettled condition. The Wage Committees of the Independent Glass Company and of the organization of their workmen are reported as having met, and as having disagreed as to the wage scale. It is believed by some, however, that an agreement was reached, but that the result of the conference is withheld for sufficient reasons. The leader of the organization whose members work in the American Window Glass Company's factories is represented as being in favor of a sliding scale of wages, to be regulated by the selling price of Glass, per box. It is understood that some of the Glass factories outside of the combinations are in favor of an early start. Demand for Glass is reported as being very light, and buyers as having adopted a waiting policy, exchanging stocks and buying from hand to mouth, in view of the possibility of a start of the fac-







Delega  
O.P. Schlafer H.C. Weber C.A. Peck  
John M. Pittman W.P. Bogardus C.N. Barnes  
C.F. Bock Fred Neudorff M.L. Corey





Delegates to THE NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION

H. N. Joy	Geo. M. Gray	Z. T. Miller	J. C.
W. H. Keating	J. F. McGuire	W. H. Tomlinson	Paul
W. P. Lewis		H. G. Cormick	



Kirchdorfer · Sharon E. Jones · J. C. Frederick ·  
Vagner · Frank A. Powers · Chas. F. Ladner · W. A. McIntire ·  
L. H. Clark · Geo. W. Hubbard ·



tories on September 1. The opinion is expressed that there is too much glass in the country for so early a start. The Jobbers' Association quotations are as follows for single and double strength:

	Discount.
From store.....	88 and 5 %
F.o.b. factory, carload lots.....	89 and 5 %

**Paints and Colors.**—*Leads.*—White Lead is in fair demand from jobbers, and manufacturers are working on orders for fall delivery. Regular quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—*Linseed Oil.*—Demand is confined to small lots, but business in this line appears to average up fairly well with corresponding seasons of former years. The large buyers are generally supplied up to September or October. Quotations, according to quantity, are as follows: City Raw, 67 to 68 cents; out of town Raw, 66 to 67 cents per gallon.

**Spirits Turpentine.**—The Turpentine market has been dull, with inquiries confined to small lots. Large buyers are not in the market, and quotations, according to quantity, remain unchanged, as follows: Southern, 46 to 46½ cents; machine made barrels, 46½ to 47 cents per gallon.

## NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION.

WITH this issue of *The Iron Age* we are sending out a supplement containing a group picture of the delegates to the third annual meeting of the National Retail Hardware Dealers' Association, held in Chicago on March 19 and 20 last. This picture was prepared from a photograph specially taken for this purpose at the time of the meeting, and we had hoped to present it long ago. In the effort to obtain the best possible reproduction a good deal of delay has ensued, a number of experiments being tried with a view to securing the most acceptable results. We think, however, that our readers will agree with us that the plate presented is one which justifies the time and labor expended upon it, and that the picture will be valued, especially by those who are interested in retail Hardware association work.

The plate gives the names of the gentlemen whose portraits are presented, but the following list also supplies their addresses, the order followed being from the left of the picture:

CHAS. F. BOCK, Battle Creek, Mich.  
 JOHN M. PITTMAN, Prescott, Ark.  
 O. P. SCHLAFFER, Appleton, Wis.  
 FRED. NEUDORFF, St. Joseph, Mo.  
 W. P. BOGARDUS, Mt. Vernon, Ohio.  
 HENRY C. WEBER, Detroit, Mich.  
 C. N. BARNES, Grand Forks, N. D.  
 M. L. COREY, Argos, Ind.  
 C. A. PECK, Berlin, Wis.  
 W. H. KEATING, Ottumwa, Iowa.  
 H. N. JOY, Hamilton, N. D.  
 W. P. LEWIS, New Albany, Ind.  
 J. F. MCGUIRE, St. Paul, Minn.  
 GEO. M. GRAY, Coshocton, Ohio.  
 W. H. TOMLINSON, Le Sueur, Minn.  
 H. G. CORMICK, Centralia, Ill.  
 Z. T. MILLER, Bloomington, Ill.  
 PAUL WAGNER, Louisville, Ky.  
 JOSEPH C. KIRCHDORFER, Louisville, Ky.  
 L. H. CLARK, Rockford, Ill.  
 FRANK A. POWERS, Norwalk, Ohio.  
 SHARON E. JONES, Richmond, Ind.  
 GEO. W. HUBBARD, Flint, Mich.  
 CHAS. F. LADNER, St. Cloud, Minn.  
 J. C. FREDERICK, Owensboro, Ky.  
 W. A. MCINTIRE, Ottumwa, Iowa.

In addition to the above there were also present at the meeting Irving A. Sibley of South Bend, Ind., William T. Gormley of Chicago, and H. Burkert of Gosport, Ind., but these gentlemen were not in attendance at the time the photograph was taken, so that they do not appear in the plate.

The officers of the National Association are as follows: H. G. Cormick, president; C. N. Barnes, vice-president; W. P. Bogardus, treasurer, and M. L. Corey, secretary.

## Death of Joseph S. Beddall.

### A VICTIM OF THE COAL MINERS' STRIKE.

JOSEPH S. BEDDALL of the Beddall-Taggart Hardware Company, Shenandoah, Pa., died on July 31 from frightful injuries received the previous evening at the hands of a mob of striking coal miners. He had attempted to reach his brother, a deputy sheriff, who with three workmen had taken refuge from the mob in a railroad station. He was unarmed, but his relationship to the deputy sheriff was known to the strikers and they attacked him, beating and kicking him until his features were unrecognizable, some of his bones were broken and his body was a mass of wounds and bruises. He was rescued from their fury before life was wholly extinct, but died in the hospital.

Mr. Beddall was born April 10, 1871, at St. Clair, Pa. While very young his parents removed to William Penn,



JOSEPH S. BEDDALL.

a little mining settlement just outside of Shenandoah. Mr. Beddall went to school at William Penn, and later took a course of training in a business college. He entered the employment of the William Penn Coal Company as an office boy and advanced until he attained the position of office manager. Four years ago he and John Taggart were admitted into the firm of G. W. Beddall & Bro., and the name was changed to the Beddall-Taggart Hardware Company. Last February he and his brother-in-law, John Dunlap, bought out the interests of Geo. W. and N. W. Beddall, the firm continuing under the same name. Mr. Beddall devoted himself energetically to the business, looking after the financial end and the office, and it became very profitable to him. He was of a quiet, thoughtful disposition and kindly in all his impulses, hence was very popular, not only in Shenandoah, but throughout the whole county. Although not particularly active in social or club life, he was a prominent Mason, a past master of Shenandoah Lodge, No. 511, and a Knight Templar. He was unmarried and is survived by his father, Benjamin D. Beddall, who for 25 years was outside superintendent of the William Penn Coal Company's colliery; by his sisters, Mrs. John Dunlap and Miss Lillie Beddall of William Penn, and by his brothers, Thomas Beddall, Jr., of Shenandoah, deputy sheriff of Schuylkill County, and Ephraim R. Beddall of William Penn.

## SPECIAL BRANDS.

**W**E have received some further communications in regard to this subject which are presented in the following columns. It will be observed that the different writers take a position in favor of special jobbers' brands as opposed to factory brands.

**FROM A. W. DOUGLAS, SECRETARY SIMMONS HARDWARE COMPANY.**

It would add a good deal to the interest and, likewise, the sincerity of the various articles on jobbers' special brands, each by "Manufacturer," in your issues of the 10th and 17th, respectively, if the authors would come out in the open, and thus indorse the opinions which they present with the authority of their name and standing. It would also give value to their points of view, which, as will be seen, are often divergent and inharmonious.

The objection that my article is based upon an ideal standpoint, and is, therefore, largely theoretical, is best answered by the direct affirmation that each statement I made is merely the recitation of an existing fact, confirmation of which I shall be glad to disclose to any doubting Thomas.

There was no attempt on my part to prove that such conditions, as I presented, were universal, but that all of them came within the limits of our observation and experience, and we are therefore prepared to testify as to the faith that is in us. The things that I presented, and as I presented them, do prevail—in St. Louis.

All of my critics have made the mistake against which I warned—that of confusing the "real thing" in jobbers' special brands with the poor imitation thereof. I have no argument to present in favor of the special brand of inferior quality which endeavors to masquerade as a prime article, and it needs only the most superficial reading of my former article to see that I have no concern with that class of special brands, and eliminated them entirely from any serious consideration.

If the manufacturers, who have replied to my article, have been so unfortunate as to have had only experience in this latter direction, then they are scarcely fair critics of an entirely different condition of affairs.

These brands, which are the imitations of better things, are interesting, however, as bearing negative testimony to the existence of something of a higher grade. This is best illustrated in other lines of business than Hardware—so as to avoid all personality—in the extensive imitations of some well known article of great merit, where the original article still holds its own and increases in sale and in renown, despite the attempt to supplant it with inferior goods—as witness the sale and fame of "Ivory Soap," "Pears' Soap," "Steinway Pianos," "Quaker Oats," and a great many other articles I could name.

There is to-day a certain brand (owned by a jobber) in the Hardware line, which, in the course of more than a quarter of a century, has become so widely and favorably known for merit that the owners of the brand have for years devoted a considerable portion of their time to preventing and stopping infringements of this brand, not only by those in the Hardware business, but, likewise, by those in entirely different lines of business.

Whether there is any permanence in a brand of this nature can best be answered by those who have endeavored to displace this brand with some pet brand of their own, and have realized that they were "up against it," and that possibly lower prices and specious arguments counted but little against a generation's experience of sustained merit, and against the further fact that many of the articles embodied excellencies and peculiarities that were the exclusive property of the jobber in question, and, consequently, were not to be found in any manufacturers' brands. The mere fact of the continued and increasing sale of this brand, with its growing reputation and merit, is the best possible answer that can be made to any attacks upon a jobber's special brand of high grade.

"Manufacturer" is rather unfortunate in selecting "true blue" goods as an example that jobbers' brands are not competitive, since every one familiar with the

situation knows that the difference between the genuine article and the imitation is as wide as a church door and as deep as a well, one being a fire finish brought about by great heat and becoming part of the metal, the other being merely a surface finish, entirely superficial and of no enduring value whatever.

It is interesting to note the statements made by two different manufacturers, one, that jobbers' brands are not competitive; the other, that they are strictly competitive, and that any jobber's brand can be displaced in the retailers' shelves with any other jobber's brand upon merely the presentation of a lower price. Now, the real facts are that jobbers' brands, like manufacturers' brands, are only competitive when compared with other jobbers' brands of equal merit and reputation. They have quite as much standing, quite as much individuality, and quite as much reputation among those who use them as have the manufacturers' brands. It is only fair to state, however, that there are numerous cases which I can cite where certain jobbers' brands are bought by the consumer solely upon merit and reputation, and where it is a well known case of "Take no other." The benefit to a retailer in the handling of such a brand needs no argument, and, as a matter of fact, the live, up to date retailer invariably endeavors to get the exclusive control of such a brand in his town.

As to the examination of jobbers' brands by jobbers themselves, that is really a simple proposition. The real test of any tool is in its use, and I know of one house where such tests are systematically, constantly and intelligently made, and where manufacturers are kept advised of the results of such tests as matters of mutual interest. This is not done with any view of usurping the manufacturer's prerogative; but simply as an additional help.

Any one who has had dealings with manufacturers realizes that the factory man, pure and simple, like every one else, gets into ruts—that he has usually little contact and less sympathy with the consumer, and is apt to exploit a theory at the expense of common sense.

I could recite numberless instances of suggestions and improvements in Hardware which have come to us from the consumer through the medium of our customers and our salesmen, to be by us, in turn, transmitted to the manufacturers to be adopted by them.

The question of the jobbing buyers' ability and experience, or his personality or his changing employers, in this connection are really "incidental diversions," as they say in the opera, and do not cut much figure, since in all well ordered and systematic houses policies and principles persevere regardless of changes in personalities.

The doubt that any manufacturer will give his very best to the jobbers' brands, to the possible denial of his own brand, is best answered by the statement that it is a matter of experience in several instances, and that this must be more potent than a mere doubt. In one particular case the jobbers' brand was one-half the entire production of the factory and was of more value to the manufacturer than the trade in his own brand.

As to the question of what manufacturers' brands have deteriorated in the past ten years I could name a good many, so can any one familiar with Hardware history, but I do not think it necessary nor in good taste. It would not be difficult to show that as many manufacturers, if not more than jobbers, had run down hill and dropped out of existence in the past quarter of a century, while it is a matter of common observation that the growth of the large jobber, particularly in the past ten years, has been one of the most interesting phenomena in commercial history. That the large jobber has extended his bounds, increased his influence and widened his field of operation is a fact too well known to need any comment.

As to the selling of catalogue houses' special brands there seems to be the widest divergence of opinion between manufacturers on this point. One of them says the "prominent manufacturers do not sell catalogue houses their special brands." Another manufacturer says, "Manufacturers sell catalogue houses in self defense, because in such instances it is the only means



they have to keep their own brands before the public." Let us analyze the situation a moment. It is unfortunately true that probably a great number of large manufacturers do sell the catalogue houses, whereas the large jobbers rarely sell the catalogue houses any special brands. If a manufacturer refuses to sell a catalogue house then the catalogue house has other means of getting the goods, as, unfortunately, there are still some jobbers, usually distant from the scene, who will sell the catalogue house the manufacturers' brands. So far as the jobber's special brand is concerned he sells direct only to the retailer, and the retailer is neither desirous nor can afford to sell the catalogue house, consequently the catalogue houses have no means of getting a jobber's brand of high grade.

The statement that they do not want to handle these brands is best offset by the experience that some of them have made most strenuous efforts to secure some of the very goods in question—i. e., jobbers' special brands of high grade, and always in vain. Therefore, the retailer who buys the jobbers' special brand realizes that he has no competition from the catalogue house, that he is protected by the jobbers, and that he can invariably get a satisfactory profit on the goods because it is manifestly to the jobber's interest to see that every retailer who handles his special brands is taken care of. Whereas, in the case of manufacturers' brands it is notorious that even among the retailers the price is so cut that the goods are not interesting as a matter of profit, and there is no way, practically, of keeping them out of the hands of any one who cares to buy them.

The jobber's brand offers the sole instance of a particular line of goods which can, by the retailer, be sold with the absolute assurance that he will be protected in profit, and that after he has borne the heat and burden of the day the fruit of his work will not be reaped by some other party who comes in at the eleventh hour.

I made no claim that a complete line of Tools were exactly of the same quality and value, but that they were of the same relative grade each one adapted in the best possible manner to the use for which it is intended, and that the question of general uniformity was one of great weight, both with the retailer and consumer.

Again let me voice experience against theory in a statement that where a certain special brand has obtained recognition and success the introduction of some new item in this line is a simple matter, as both the retailer and the consumer accept immediately the fact that it is of the same general high character as the rest of the line in question. "Manufacturer" has certainly not studied the drift of events if he fails to realize the great advantage of a uniform and harmonious line of goods, and this advantage can be obtained only by handling a jobber's special brand.

As to the wisdom of the retailer putting himself in the hands of jobbers, it would be hard to find any one who is more directly interested in the prosperity of the retailer than is the jobber. The Hardware jobber whose principles are not "founded on the sand" has practically cast his lot with the retailer. The prosperity of one is the prosperity of the other, and it is purely a case of mutual self interest, and in a house of this nature, such as I have described, the first consideration in every instance where a new problem is presented is as to whether it is to the interest of the jobber's customer—the retailer.

In regard to the matter of claims, it must never be forgotten that the jobber is practically the principal means of communication between the manufacturer and the retailer; that he is, therefore, that much closer to the retailer and the manufacturer is just that one step removed.

It is a fact of every day comment that the jobbers' dealings with the retailer on the matter of claims are based on entirely different ideas than those of the manufacturer. The jobber's guarantee as to his special brands means that the matter need be carried no further than the jobber himself, since the manufacturer has no part in it whatever. The jobber, through his salesman and by his contact, realizes the needs of the retailer

infinitely better than can manufacturers, and he is much more apt to dispose promptly and satisfactorily of claims without the tedious delays of technicalities and questionings which invariably come in when this matter is carried to the manufacturer. When the guarantee of the manufacturer's brand is under discussion the matter first comes to the jobber, who, in turn, transmits it to the manufacturer, and we all know what it means to get your impressions second hand.

It would probably interest some one of the manufacturers who replied to my article to know that in a large jobbing house the claim department is one of the most thoroughly systematized, carefully watched over and well ordered departments in the business and that the greatest possible stress is laid upon the proper handling of claims from the retailer. Within the limits of the jobber's guarantee he can always be depended upon to promptly make good his word and to dispose of the claim in short order.

As to the various theories as to what is best for the retailer, I have thought it wisest to let him speak for himself as being the best authority on that subject, and in my former communication I published a letter from a dealer which seems to me of more weight than many outside opinions, and there are more communications of this kind on tap if further argument is needed.

#### FROM A HARDWARE HOUSE IN KANSAS.

Being much interested in the discussion on special brands, and knowing it to be in the interest of the retail merchant as well as the Hardware trade in general, I, a retail Hardwareman, herewith send you my sentiments in answer to the article published in *The Iron Age* July 17 signed by "A Manufacturer."

The strongest impression which a retailer gets from either of the two articles signed by "Manufacturer" is the lack of familiarity of the writer with the actual conditions which surround the retailer and with those things which either make or mar his success.

The first "Manufacturer," who dissects Mr. Douglas' article into seven parts, starts off by saying that every retailer who reads the article sees that it consists of the following points. Of course if that were so it would have been unnecessary for "Manufacturer" to have explained these points at length. As a matter of fact I doubt whether any retailer thought of any one of these points in the same way that this gentleman who signs himself "Manufacturer," attempts to bring them out in his answer.

In his first provision he makes a broad statement, that no retailer is likely to be impressed with the argument made by Mr. Douglas that manufacturers put up the special brands of some jobbers in a higher finish and higher grade generally than their own corresponding brands.

Not only are many retailers likely to be impressed by this argument, but many know absolutely from personal experience that such is the fact, and those who have been fortunate enough to have had experience with special brands, other than the retailer's experience, know beyond any question that this is a fact in connection with that class of jobbers whose special brands are handled in the way Mr. Douglas cites. Some of the statements made by "Manufacturer" do, no doubt, apply to a certain class of jobbers, whose special brands are not kept up to the highest standpoint, but as Mr. Douglas stated distinctly that his statements did not refer to that element, "Manufacturer's" answer tends to confirm rather than contradict.

In the second paragraph "Manufacturer" again shows a wonderful lack of knowledge of the situation when he states that there are no jobbers in the country who have for the last 25 years gone right on and developed under successive managers. Any Hardware dealer in the country could name to him several who have done so. Still he says there is not one.

In the third division "Manufacturer" shows very evident failure to grasp the great advantage which occurs from the sale of one article which proves satisfactory and which creates a demand for other goods of the same brand. A Hand Saw under such a brand, which proves eminently satisfactory to the purchaser, brings

him back past the doors of other Hardware dealers to obtain a File or Chisel of the same make.

In the fourth division there is again a wonderful lack of familiarity with the experience of a retailer, in the "Manufacturer's" statement about a retailer being referred to the manufacturer when he makes a claim regarding a Tool. That is just exactly the one thing that never occurs with a jobber's special brands. That happens frequently when a retailer buys a manufacturer's brand of Tools from a jobber, but a claim on a jobber's brand is adjusted by the jobber personally without reference to the factory, and generally very promptly. If "Manufacturer's" statement in this paragraph was in accordance with the facts his argument about the careful concealment of the name of the maker of the jobber's special brands is contradicted. The jobber could not carefully conceal this information and at the same time follow the custom, which "Manufacturer" condemns, of referring the merchant to the maker of the Tools.

In the fifth division "Manufacturer" attempts to show that the retailer has no protection when he controls the jobber's special brand, because his competitor across the street gets another jobber's special brand and it is a "standoff between them." Still, a little further down in this same article, this same "Manufacturer" claims that the jobber has "no competition on his private brand." Both of these things cannot be true, because if the jobber's private brand is sufficiently distinctive as to result in his having no competition on it then it is also sufficiently distinctive to be a protection to the retailer.

In the sixth division "Manufacturer" attempts to show that a retail merchant who has built up a trade on a jobber's special brand is completely at the mercy of that jobber. Whereas, as a matter of fact, he has the protection of that jobber, protection of a character that he cannot enjoy in handling manufacturers' brands, which, as "Manufacturer" says, can be had of "a number of competing jobbers." The fact that they can be had of a number of competing jobbers is also responsible for the fact that they can be obtained by a number of competing retailers, which results in his being unable ever to enjoy the results of his own efforts in building up a trade on any line of Tools except that of some jobber who will protect him in it. In the case of his handling the manufacturer's brand he is at the mercy of any competitor who takes a notion to obtain from one of the "many competing jobbers" this same article under the manufacturer's brand; in other words, at the mercy of the competitor, who is interested only in pulling down his business rather than building it up. Whereas the jobber is directly interested in his success and in his continuing the very large trade on his own brand of tools, and having that trade without interruption and at a margin of profit which encourages him "to push the goods." Then "Manufacturer" quotes the old adage, "Goods well bought are half sold," which, while all right when properly used, has probably done twice as much damage to the people who have been deceived by it than it has ever done good to those who have understood it. A retailer is in business for the purpose of seeing how much money he can make, not how cheap he can buy his goods; and while the price at which he can buy his goods largely affects the amount of money which he can make, it is not always so; in fact, it very frequently happens that the cheapest goods are the least profitable, and that he could often make more money on goods that cost a little more and which according to the adaptation of the adage as "Manufacturer" uses it, would not be well bought.

In the seventh division "Manufacturer" makes the statement that Mr. Douglas' argument about the goods which are handled by the catalogue houses "falls flat," because of "Manufacturer's" statement that it applies quite as well to some manufacturers' brands as to the jobbers' brands. The trouble is that the retailers can never tell which of the manufacturers' brands this is going to apply to.

First, because he cannot tell which of the manufacturers is going to think it wise to sell direct to the catalogue houses, as many of them do, nor can he tell which

of the others are going to sell their goods to some of the jobbing houses in far away territories, who will, in turn, supply the catalogue houses, so that often, should the manufacturer be inclined to sell the catalogue houses direct, the catalogue house buyer can, if he desires, get these goods from some far away jobber, who either knows nothing of the situation or cares less about it, because of his having no trade among the retailers who do business in the territory where the catalogue houses' price-lists are circulated. It is practically impossible for the manufacturer to prevent his goods getting into the hands of the catalogue houses through such channels in sufficient quantities to warrant them putting in their price-lists and selling a few at very low prices just to make a sensation, attract the attention of the consumer and incidentally "get even with the manufacturer" for refusing to sell them goods.

Here again "Manufacturer" shows that he is not in touch with the situation of the retailer, who is, on the other hand, thoroughly safe in his control of a jobber's special brand, which not only a designing competitor cannot obtain, but which it is impossible for the catalogue houses to get, because there is but one source of supply—viz., the jobber in question—and that jobber will ship his goods only to the retailers, who are his agents, and they, in turn, would not ship them to the catalogue houses, because they are, above all others, most interested in keeping these goods out of the hands of such establishments, so that this last argument instead of falling flat, as it appears to "Manufacturer" from his bird's eye view of the situation, is, on the contrary, one of the greatest elements in the building up and preservation of the trade of the retailer.

The three paragraphs in which "Manufacturer" winds up his article gives the retailer who reads it and who is right up against conditions and facts, not theories or ideas, the impression that it is written from the standpoint of a man who thinks of the situation in which a retailer is placed as being what, in his opinion, it should be rather than what it is.

He starts out by saying that it is only human nature for the manufacturer to put more care in the production of an article which bears his name than in one from which his name is carefully obliterated and the jobber's substituted. But he fails to state, very evidently from lack of experience, that it is also human nature for that same manufacturer to nurse the largest and most profitable account he has and which every competitor is very anxious to get, and the losing of which would cut down his business by half, and when he knows, as he does know from experience with those jobbers to whom Mr. Douglas has referred, that he can hold that account as long as he keeps his goods up to the highest possible standard and quality and finish, and make them second to none. Self preservation, which is the first law of nature, leads him to do that, because he cannot afford to do otherwise.

In the second closing paragraph of "Manufacturer" he states that the jobber's main reason for wanting the manufacturer's name off the goods and his own substituted, is to enable him to ask a higher price from the retailer. Here again he simply reiterates and confirms Mr. Douglas' statement that there are some who make that mistake, but those are not the class under discussion, and it is an every day fact, familiar to practically every clear headed retail merchant, at least in the Middle West, Far West and Far South, that those jobbers who handle the special brand business on the lines indicated by Mr. Douglas do not ask a higher price than is asked and obtained on similar goods under the manufacturer's brand.

In the next paragraph he harps again on the same point attempted earlier in the same article about goods which are well bought, but adds nothing to it except the idea that the retailer who follows this plan is "independent." The retailer cannot afford this kind of independence at the price it costs. Most of those who have been eminently successful in point of profits will be found to have had a close alliance with some good, strong, reliable jobber, who, recognizing a mutual interest in the retailer's success, does everything in his power to contribute to that success and share in the result



of it. Co-operation of this character between jobbers and retailers who are in close daily touch with each other has built up the retail trade of this country, and the progress in that respect has been steady because, in time of depression, when the retailer needed a friend, he had it in the jobber, who helped him over the rough places and was glad to do so. The Robinson Crusoe, the "independent" man, who had made no friends, usually fell by the wayside and was soon forgotten.

In the concluding paragraph of this article "Manufacturer" talks about the retailer buying nothing but the best factory brands, and thereby placing himself closer to the factory than if he has a jobber's brand. His use of the word "best" of factory brands shows in the first place the necessity on the part of the retailer, who follows that plan, of watching closely the differences in point of quality between the brands of the various manufacturers, and changing constantly as one manufacturer improves and the other goes backward in point of quality, as is frequently the case. No retailer who considers the important end of his business the front of the store where goods are sold has either the time or facility for watching those points, nor can he possibly have the intricate knowledge of every article he handles that will enable him to always choose the best or keep up with the varying market.

The jobbers' buyers are, on the other hand, skilled in this matter, selected because of their wide experience, each in his own line given every possible facility in that direction, and his entire time to devote to it. The retailer can, therefore, far better select some good reliable jobber on whom to depend to be very much more sure of getting the desired results and devote his own time to the profitable end of his business, waiting on his customers or seeing that they are waited on, and cultivating their friendship. This is the part of the business where the margins are 50 per cent. and not 5 per cent., and the end, therefore, that demands and merits his personal time and attention. He can add more dollars and cents to his profit account one hour in the day in the front of his store bringing to the attention of his customers and selling profitable articles that have to be "sold" by some one interested in them, than he can by a whole day's time spent in the back end of his store poring over price-lists, or figuring out an extra 5 per cent., which he can get only by purchasing three times as many goods as he ought, and otherwise would from the jobber, locking up just three times as much capital to make the same sales and losing as a consequence several times the amount of extra discount obtained for the quantity purchased.

"Manufacturer" looks at this subject entirely from his own point of view. To him, the most important, yes, the all important element, in the business of the retail merchant, is the purchasing of his goods. Every clear headed merchant knows that this is not the case. While buying is of great importance, it is secondary in importance to selling. The money is made in the front of the store, selling the goods, and not in the back of the store buying them. Of course, the ideal plan is to buy at the least possible price and sell at the highest. Most retail merchants have not the time and facilities or the force of assistants to do both to the limit of their possibilities. They have to do, as most other people have to do in mercantile life, the best they can, to come as near as possible to what they would like to do if they had the time, the strength, help and capital to do it. Not having all of these in ideal quantities, the question for each one is, what is the best I can do? I am in business to see how much money I can make. I am not in business to see how big a noise I can make, how much of a show I can make, how many goods I can sell, but how cheap I can buy them and how much I can make on them. Noise is a good thing in its way, display likewise; volume of sales has its advantages, buying goods cheap will help us to make a profit on them, but all of these have very little weight in the matter as compared to selling the goods. A customer comes in to buy a couple of pounds of Nails. A clerk, who is getting so much a month and has no interest in the transaction, is engaged in conversation with a friend. While he does not resent the interruption exactly, he goes and gets the man's Nails, takes

his money, puts it in the cash drawer and resumes the conversation, provided the proprietor is not around. If the head of the house is there, however, the clerk will take more interest in the transaction, or the proprietor himself will engage the customer in conversation, get him interested in some new article that has been recently brought to his attention by the enterprising representative of an up to date jobber, something that has just has been put on the market, and in most cases effect the sale, which would not have been made had the proprietor not been looking after the sales end of the business, and in which the profit will in all likelihood amount to more than the difference this merchant could possibly make in his purchase prices by working all day in his back office. He could make more money in this one sale in a few minutes and have all the rest of the day to do the same thing, than he could possibly make by all the close figuring and correspondence he could do in the whole day, and even then, if he did get some low prices, lower than those that the jobber is accustomed to make, he would have to buy a sufficient quantity to make the interest and the locking up of his capital amount to more than the saving.

If "Manufacturer" is in reality the maker of any line of goods handled regularly by retail Hardware dealers, he is evidently one of those who stays in his factory in some town in New England, who does not come in contact with, and is not in sympathy with, the retail Hardware merchants in the different parts of the country. He evidently does not recognize what that merchant is up against. A visit of two or three days to some live, energetic, money making retail dealer in the Middle West would open his eyes to a whole lot of things that have been working their way into the conditions that surround retail merchants of to-day, and which "Manufacturer" evidently has no knowledge of whatever. He would look at things very different and learn that the Hardware business as it is in the store of the retail merchant, that the many battles he has to fight on all sides, is a very different proposition than it is at the factory down East.

## THE W. BINGHAM COMPANY'S CATALOGUE.

A CATALOGUE of 1183 pages, bound in cloth and leather, has just been issued by the W. Bingham Company of Cleveland, Ohio, relating to Hardware, Railway, Miners', Engineers', Architects', Machinists' and Tanners' Tools and Supplies, Cutlery, Guns and House and Hotel Furnishings. This is the third catalogue published by the house, the business having been established in 1841 and incorporated in 1888. The alphabetical index at the front of the book occupies 35 closely printed pages, this being immediately followed by illustrations, descriptions and prices of the goods. The book is well bound and nicely printed on a fine quality of paper, and will be received with due appreciation by the company's numerous customers.

## PRICE-LISTS, CIRCULARS, &c.

THE PUFFER-HUBBARD MFG. COMPANY, Minneapolis, Minn.: Illustrated catalogues A and D, devoted to Wheelbarrows, Tanks, Trucks, Carts, &c. This company succeeded the Sweatt Mfg. Company in 1890. The company have recently increased their facilities for the manufacture of all kinds of Wooden Tanks, for use on railways and on the farm.

ELECTRIC HEATING COMPANY, Detroit, Mich.: Catalogue supplement No. 30, July, 1902, showing new designs and additions made to their line of manufactures. The supplement illustrates and describes Electric Cooking Ovens, Range Cooking Outfits and Glue Pots.

THE GRAHAM MFG. COMPANY, Derby, Conn.: Out of a catalogue of 256 pages, 204 pages are devoted to Keys and the remainder to Hardware specialties.

Fire in the basement of the Mohr Hardware Company's establishment at West Bay City, Mich., a short time since inflicted damage approximating \$800, fully covered by insurance.

## ANNUAL OUTING OF THE CHICAGO RETAIL HARDWARE ASSOCIATION.

**T**HE CHICAGO RETAIL HARDWARE ASSOCIATION held their eighth annual picnic on Wednesday, July 30, at Palos Park, located on the Wabash Railroad about 20 miles from Chicago. The attendance was unusually large, but through the co-operation of the railroad officials with the transportation committee of the association, ample facilities were afforded, making the trips going and coming very enjoyable. The day was ideal and the efforts of the committees on entertainments were crowned with success. The morning was devoted to general social enjoyment. Immediately after dinner, one of the most important functions of the day, the association took up a line of march, conducted by President D. McLaughlin and Treasurer J. L. Smith, and preceded by a band of 25 pieces, paraded about the grounds into the pavilion, where the members formed in a double row with a single connecting line, forming the letter H for Hardware. W. H. Bennett, local manager of the Reading Hardware Company, introduced D. W. Simpson, president of the Wilcox Mfg. Company, Aurora, Ill., who, on behalf of the association, presented Mr. McLaughlin with a gold headed cane in token of the esteem in which he is held by his fellow members. Mr. Simpson's address was as follows:

President McLaughlin: I have the pleasure of addressing you at this time on a matter of special interest to all here assembled. I regret that I am almost a stranger to you, and feel quite sure that some one more acquainted with you and your work as president of the Chicago Retail Hardware Association had better been chosen to perform the pleasant task assigned me. In looking for help and data regarding yourself, I naturally wrote to those who I supposed were your friends, and the replies I received I must refrain from reading here. Allow me to suggest that in the years to come, should you ever want for testimonials or letters of recommendation, do not apply to your friend Bennett or Roberts, as those I have would, at least, be very hard to construe as letters from a friend. And now, in behalf of the association of which you are the president, and for whom they have such high regard, allow me to present to you a staff upon which you can safely lean as you make the declivity of life. May you live long and wear dim the inscription engraved in the solid gold as it is in the hearts of those for whom I present this, their token of regard.

Mr. McLaughlin in replying, after thanking the association for the unexpected gift, said that he was well aware that the success of the day's outing was largely due to the efforts of his maligned friends, W. H. Bennett and H. H. Roberts. He appreciated highly the honor bestowed upon him and promised to reply more fully to the members at their next meeting.

The formalities over the entire gathering joined with zest in the games which had been prepared by the committees. One of the most popular modes for the day's enjoyment was dancing in the pavilion. The races, in which the dealers, their wives, their sisters, their cousins and their aunts, as well as the children participated, were exciting and provoked much merriment. The judges of the contests were W. H. Bennett, H. H. Roberts, S. P. Johnston, D. W. Simpson and H. E. Bullen.

The bowling contests were of unusual interest, but the special feature of the day was the baseball game between two nines, representing the dealers and the jobbers of Hardware. George W. Trout was captain of the jobbers' nine, and Fred. Ruhling of the dealers' nine. The game was hotly contested, and victory perched upon the banner of the dealers, the score being 7 to 15. The following is a list of the jobbers: Repsold, rf.; Stewart, 2b and p; Vollrath, 1b and p; Cutler, p, 1b and 2b; Porter, cf; Powers, c; Nuttbaum, 3b; Trout, ss; Kaiser, lf. Dealers: Fred. Ruhling, 2b; T. Engelhardt, cf; Norsworthy, c; Gnadt, rf; G. Ruhling, ss; Bullen, lf; Weagert, p; McClure, 1b; Blockie, 3b. The winners were each presented with a Razor, which had been donated by the Lawton Cutlery Company.

An open ball game was played in the morning between the following two teams, the last named being the successful contestants, and the score being 16 to 4. First, J. Spies, Cutler, Pearson, Hays, Lyman, W.

Spies, H. Hassner, Long and Bullen; second, Wallbaum, Matthews, Hessner, Norsworthy, Dillan, Lahey, Nolan, Dananer and Beiersdorf. Each of the winning teams received a Pocket Knife, donated by George W. Trout & Co.

At 5 p.m. the various prizes, which had been awarded by the judges, were announced, and later distributed. The two prizes offered by *The Iron Age* for the closest guess to the total number of advertisements in the issue of July 31 were exhibited. There was much interest displayed, nearly 400 guesses being deposited in the ballot box. Of course the award could not be made until the following day. The result of the contest will be found in another column of this issue.

The following is a list of the prizes offered and the awards made: Coupons drawing prizes: First, Ranney Refrigerator, donated by Ranney Refrigerator Company, E. Allen; second, portable Gas Lamp, donated by the Lumo Company, No. 1064, unclaimed; third, Puritan Oil Heater, donated by the Cleveland Foundry Company, No. 1012, unclaimed; fourth, Ideal Ice Cream Freezer, donated by C. M. Avery & Co., No. 429, unclaimed; fifth, Two-Burner Hustler Hot Plate, donated by Brand Stove Company, No. 971, unclaimed.

Ladies' Bowling Contest: First, Ivory Handle Cake Knife, donated by Landers, Frary & Clark, Mrs. Reitz; second, Wringer, donated by Wallis, Robinson & Co., Mrs. Gutgesell; third, Lightning Ice Cream Freezer, donated by C. Sidney Shepard & Co., Mrs. S. A. Engelhardt; fourth, Connecticut Food Chopper, donated by C. M. Avery & Co., Miss Bertha Engelhardt; fifth, Aluminum Tray and Scrape, donated by C. Sidney Shepard & Co., Mrs. Schramm.

Men's Bowling Contest (Open Game): First, Two Etched Hand Saws in Case, donated by Bishop Saw Company, J. Gutgesell; second, 50 feet of Garden Hose, Reel and Nozzle, donated by New York Belting & Packing Company, Henry Stuckart; third, Hot Plate, donated by Geo. M. Clark & Co., A. Niesel; fourth, Little Giant Water Heater, donated by Chas. Smith Company, J. Schmitz.

Men's Bowling Contest (Members Only—No Proxy): First, Etched Silver Steel Hand Saw, donated by E. C. Atkins & Co., A. Dalstrom; second, Etched Silver Steel Hand Saw, donated by E. C. Atkins & Co., H. Guthaus; third, Roll of No. 48 Climax Wire Cloth, donated by Gilbert & Bennett Mfg. Company, A. Niesel; fourth, No. 3 Ash Can, donated by American Can Company, Hans Fehr.

High Score Prize: First, Silver Smoking Set, donated by J. D. Warren Mfg. Company, Geo. Engelhardt; second, Nickel Plane, donated by W. G. Miller, H. P. Gnadt; third, Set of Bits, donated by Forest City Bit Company, C. A. Dalstrom.

Hardware Dealers' Race (Members Only): First, Silk Umbrella and Cane, donated by Reading Hardware Company, G. A. Neeb; second, Briar Pipe, donated by the American Artisan, Fred. Ruhling; third, Water Cooler, donated by C. Sidney Shepard & Co., H. O. McClure; fourth, No. 2 Ash Can, donated by the American Can Company, M. B. Hummel.

Married Ladies' Race: First, Silver Coffee Pot, donated by Wilcox Mfg. Company, Mrs. Uebelbock; second, Silver Chafing Dish, donated by the American Artisan, Mrs. Lutz; third, Wringer, donated by the American Wringer Company, Mrs. Behles; fourth, Enameled Tea Pot, donated by J. J. Vollrath Mfg. Company, Mrs. J. J. Smith; fifth, Enameled Aluminum Tray and Scrape, donated by C. Sidney Shepard & Co., Mrs. Denny.

Single Ladies' Race: First, Manicure Set, donated by Bullard & Gormley Company, Lulu Sheehan; second, Croquet Set, donated by L. Gould & Co., Eva Engelhardt; third, Enameled Tea Kettle, donated by Jacob J. Vollrath Mfg. Company, Florence O'Hearn; fourth, Enameled Coffee Pot, donated by Jacob J. Vollrath Mfg. Company, Mary Hart; fifth, 100 visiting cards, donated by McBreen, printer, Ella Hart.

Boys' Race: First, Pocket Knife, donated by Lawton Cutlery Company, Thos. Mee; second, Pocket Knife, donated by Lawton Cutlery Company, Jos. Mee; third, Pocket Knife, donated by Lawton Cutlery Company, Edward Beiersdorf.



**Tinners' Race:** First, set of Buffalo Tinners' Snips, donated by J. L. Perkins & Co., Charles Engelhardt; second, set of Reliance Tinners' Snips, donated by Compton Shear Company, Conrad Dalbke; third, set of Weiss Tinners' Snips, donated by A. Freeman, Daniel Redmond; fourth, Enameled Wash Bowl, donated by Jacob J. Vollrath Mfg. Company, A. Borchardt.

**Girls' Race (Under 14 Years):** First, pair Embroidery Scissors, donated by Bullard & Gormley Company, Hattie Ortman; second, pair Embroidery Scissors, donated by Bullard & Gormley Company, Clara Koettke; third, pair Embroidery Scissors, donated by Bullard & Gormley Company, Katie Breckwoldt.

Hibbard, Spencer, Bartlett & Co. were represented by R. J. Blumm, W. F. Waller, Albert Fritchle and G. Pearson. These gentlemen were active in the distribution of souvenir fans, representing the Chrisolyte Enameled Ware of the firm.

Among the manufacturers, jobbers and agents present were the following, all of whom were from Chicago, except as noted:

Allen, H. E., Lumo Company.  
Barrick, Wm. H., Abram Cox Stove Company.  
Bennett, W. H., Hermann, R., and Matthews, W. C., Reading Hardware Company.  
Bowler, T. J., Bowler Cutlery Company.  
Bullen, H. E., Dillon, C. L., Gormley, J. H., and Hessemer, Edward, Bullard & Gormley Company.  
Cutler, W. S., Ranney Refrigerator Company.  
Corbett, Newton, H. Channon Company.  
Dennison, C., C. Sidney Shepard & Co.  
Trout, Geo. W., Wilmarth, W. O., and Dickson, Andrew, Geo. W. Trout Company.  
Fentress, Jas., Cleveland Foundry Company.  
Geschwind, E. O., Landers, Frary & Clark.  
Gould, S. S., St. Louis Shovel Company, St. Louis, Mo.  
Holt, Geo. D., National Enameling & Stamping Company.  
Herbert, E. W., Edwin Hunt's Sons.  
Hall, A. B., Whitman & Barnes Mfg. Company.  
Johnston, S. P., and Stern, Mark, *American Artisan*.  
Johnson, J. K., Allerton-Clarke Company.  
Lennon, Jas. E., and Nelson, W. C., American Screw Company.  
Lyman, W. B., Brand Stove Company.  
Miller, J. E., Forest City Bit Company.  
Miller, Wm. D., manufacturers' agent.  
Ohlendorf, A. C., manufacturers' agent.  
Peglow, L. A., and Simons, E. L., Wells & Nellegar Company.  
Perrigo, Stephen M., E. C. Atkins & Co., Incorporated.  
Roberts, H. H., and Partridge, W. T., *The Iron Age*.  
Schmelzer, Louis, American Wringer Company.  
Simpson, D. W., Wilcox Mfg. Company, Aurora, Ill.  
Sinzich, J. J., Bishop Saw Company.  
Schmitz, R., Orr & Lockett Hardware Company.  
Smith, J. L., Jr., Lisk Mfg. Company, Limited.  
Stephens, W. C., P. & F. Corbin.  
Stewart, A. T., A. T. Stewart & Co.  
Vollrath, Carl, J. J. Vollrath Mfg. Company.  
Widener, M. B., Cook & Van Evera Company.  
Whitlock, H. W., Reading Stove Works.

#### The Committees.

Special credit is due to the several committees of the association for the successful manner in which all arrangements were made. These committees were composed as follows:

**Executive Committee**—Anthony Engelhardt, Frederick Ruhling, J. L. Smith, Frederick Kurtz, W. B. Costello, E. L. Sommers.

**Transportation Committee**—J. L. Smith, G. A. Lott, Geo. A. Neebe, J. H. Powers, H. E. Gnadt, W. J. Krueger, H. O. McClure.

**Entertainment Committee**—F. F. Porter, A. L. Adam, Martin Engelhardt, Otto Hagen, J. F. Borchardt, H. L. Peterson, O. Stebbins, Christian Carr, Jr.

**Bowling Committee**—Geo. A. Englehardt, E. Sanders, F. H. Schanze, C. A. Dalstrom, Hans Fehr, John Hora.

**Games Committee**—W. T. Gormley, D. McLaughlin, L. Rosenberg, Grant W. Porter, J. C. Schubert, J. M. Ruedell, B. F. Boysen, J. C. Wirths.

#### The Iron Age Guessing Contest.

As an incident of the picnic the Chicago office of *The Iron Age* offered to the lady guessing nearest to the total number of advertisements in *The Iron Age* of July 31 a silver cake dish, and to the gentleman making the closest guess a dress suit case. Much interest was manifested by those present and the total number of ballots or guesses cast was 394; the lowest guess was 103 and the highest 14,197. Mrs. W. F. Rust, daughter of Treasurer J. L. Smith of the Association, and E. W.

Drumm, connected with the New York Belting & Packing Company of Chicago, were the successful contestants, each guessing 1313. The total number of separate advertisements in *The Iron Age* of July 31, as counted by W. H. Bennett, local manager of the Reading Hardware Company, who had been selected as

Chicago Retail Hardware Association Annual Picnic July 30, 1902

**LADIES' PRIZE**

Lady guessing nearest to total number of advertisements in *THE IRON AGE* of July 31st, 1902, will be awarded **SILVER CAKE DISH**

My guess 1313

DEPOSIT YOUR  
GUESS IN BOX  
AT GROUND

Name Mrs. W. F. Rust  
Firm J. L. Smith  
Address Chicago

Persons desiring copies of July 31st issue can secure them gratis at the office of *THE IRON AGE*, 1205 Fisher Building, Chicago.

Chicago Retail Hardware Association Annual Picnic July 30, 1902

**GENTLEMENS' PRIZE**

Gentleman guessing nearest to total number of advertisements in *THE IRON AGE* of July 31st, 1902, will be awarded **DRESS SUIT CASE**

My guess 1313

DEPOSIT YOUR  
GUESS IN BOX  
AT GROUND

Name E. W. Drumm  
Firm New York Belting & Pkg. Co.  
Address 150 Lake St. Chicago

Persons desiring copies of July 31st issue can secure them gratis at the office of *THE IRON AGE*, 1205 Fisher Building, Chicago.

The Winning Cards in The Iron Age Guessing Contest.

judge of the contest, was 1325. Fac-similes of the winning cards are given herewith.

*The Iron Age* congratulates the winners and thanks the four hundred that entered the lists for their appreciation.

#### REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Ellis W. Morse & Co. are about opening up in the mill and steam supply business at 112 Court street, Binghamton, N. Y. They will do both a retail and jobbing business, and expect to cover considerable territory outside of Binghamton. The new firm would be pleased to receive catalogues and price-lists pertaining to their line.

#### TRADE ITEMS.

L. W. HEMP of Hemp & Co., St. Louis, Mo., manufacturers of Stove Pipe, Air Tight Heaters, &c., recently departed on a pleasure trip to the Pacific Coast.

GRAHAM NUT COMPANY have succeeded John Charles & Co., Pittsburgh, Pa., and will continue the manufacture of Hot Pressed Nuts, Bolts, &c. The company consists of Albert Graham, Harry C. Graham and Chas. J. Graham.

THE S. M. HOWES COMPANY, 42-46 Union street, Boston, Mass., are manufacturing a line of French Folding Screens for fire places which are finished in pure brass, gilt, lacquer and Berlin black. They are made in a large variety of styles and in various heights. The company state that they are the only manufacturers of this line in the United States and that their Screens are heavier, smoother finished and generally better than the imported articles. Their line of Screens is shown in connection with a variety of fire place goods made of brass, wrought iron and cast iron in the same catalogue, which is now ready for distribution. The catalogue shows a large variety of Basket Grates, Andirons, Fire Sets, Fenders, Bellows, Brushes, &c.

## BRITISH LETTER.

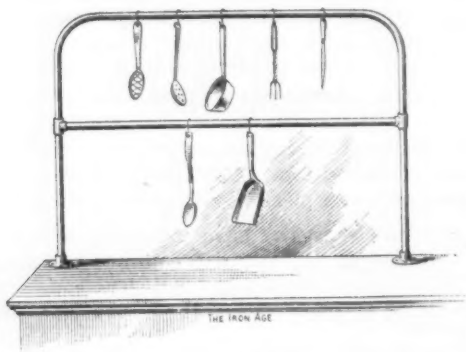
Office of *The Iron Age*, HASTINGS HOUSE,  
NORFOLK ST., LONDON, W. C. }

## The Week's Hardware Trade.

THE week has been a quiet one on the whole. It is the usual transition period—the summer orders have been filled and the autumn deliveries not yet begun. The lighter industries are almost somnolent. There is a slightly increased demand for Gas and Electric Fittings, but the competition is unusually keen in Gas Tubing. Some good orders have come in for Metallic Bedsteads, but the unsteady price of copper is having a depressing influence upon the brass and copper working industries. There is a brisk demand for high conductivity Copper Wire and Tape. Hearth Furniture is in good request, while iron plate workers are busy on Kettles, Tanks and Sanitary Appliances, but the complaint is made that prices are not remunerative. There has been a good hay harvest and this has stimulated the demand for Scythes, Reaper Sections, Rakes and similar goods. Large stocks of these were accumulated during the cold weather; they have now been to a large extent cleared. There is an active trade in Spades, Shovels, Forks, Hoes and Garden Tools—fine weather having come at last. The busy extension of tramway systems up and down the country has led to heavy purchases of special kinds of Picks, Shovels and Hammers. The File trade has been stagnant for some time, but now shows signs of improvement. The Sheep Shears trade is having queer ups and downs. The Australian drought was bad for it, but good orders have just come in from South Africa. There is also an increasing demand for Sheep Shears from South America. The export trade is suffering by the Australian drought and many of the South American markets are distinctly weak. A good trade is being done with China, Japan and the Far East. Interest still continues to center upon South Africa. The proposed Houston line of independent cargo boats to South Africa may, it is hoped, stimulate shipments thither. I hear that the British Industrial Commission is likely to report favorably upon the prospects of trade in Railway Material, Bridge Work, Electrical Apparatus, Galvanized Iron, Mining Machinery and Cultivating Goods.

## A PIPE RACK FOR DISPLAYING KITCHEN UTENSILS.

IN the accompanying illustration is shown a rack made of 1-inch water pipe that is placed on the back of a counter in the store of Stark Bros., Stamford, Conn.



A Pipe Rack for Displaying Kitchen Utensils.

From this are hung small kitchen and household utensils by means of copper wire bent with a hook at each end. This rack serves as a convenient way of bringing to the attention of customers a line of small articles that are frequently lost sight of in the store.

THE contract for Hardware for the Minnesota State Capitol has been awarded to the Gardner Hardware Company of Minneapolis. The statement in our issue, July 10, that this contract had been secured by a Chicago house was thus in error.

## CONTENTS.

	PAGE.
Some Special Tools at the Fore River Shipyard. Illustrated.	1
To Manufacture Track Supplies.....	7
Shenango Valley Iron Notes.....	7
Lake Iron Ore Matters.....	8
Gas Engine Research in Germany.....	9
The John Fritz Gold Medal.....	9
The Metric System Abroad.....	10
The Slocumb Sheet Metal or Rubber Gauge. Illustrated....	10
The Russian Iron Industry in 1901.....	11
Continuance of the German Crisis.....	11
Canonsburg Steel & Iron Works.....	11
Notes from Great Britain.....	12
The Pope Tin Plate Company.....	12
The Baldt Casting Process. Illustrated.....	13
The Jefferson Iron Company.....	13
Canadian News.....	14
Scientific and Technical Notes.....	15
Alcohol Motors in Germany.....	15
The Acme Bolt Heading, Upsetting and Forging Machine. Illustrated.....	16
Central Pennsylvania News.....	16
Republic Iron & Steel Company.....	18
Editorials:	
Gold Exports and the Money Supply.....	19
Water Tube Boilers in the World's Navies.....	19
The Gas Engine in the Rolling Mill.....	19
The Battle of Gun and Armor.....	20
Correspondence.....	20
Modern Developments in the Production of Open Hearth Steel	21
The United States Realty & Construction Company.....	23
Our Imports and Exports of Iron and Steel.....	24
The Glasgow Pig Iron Warrant Market.....	24
The Pressed Steel Car Litigation.....	24
Personal.....	25
Manufacturing:	
Iron and Steel.....	25
General Machinery.....	25
Boilers, Engines, &c.....	26
Fires.....	26
Foundries.....	26
The National Steel Refining Company.....	27
American Union Electric Company.....	27
The James E. Thomas Company.....	27
The Tin Plate Vote.....	27
American Steel Hoop Company Scale.....	27
The Iron and Metal Trades:	
Comparison of Prices.....	28
Chicago.....	28
Philadelphia.....	30
Cleveland.....	31
St. Louis.....	31
Cincinnati.....	32
Birmingham.....	32
Pittsburgh.....	33
The Chicago Machinery Market.....	34
Boston Machinery Market.....	36
The Philadelphia Machinery Market.....	36
The New York Machinery Market.....	38
Information Wanted.....	38
Southern Machinery Dealers.....	39
Iron and Industrial Stocks.....	39
New York.....	39
Metal Market.....	39
July Fluctuations in Iron Stocks.....	40
American Steel Foundries Company.....	40
Hardware:	
Condition of trade.....	41
Notes on Prices.....	43
National Retail Hardware Dealers' Association.....	45
Death of Joseph S. Beddall. Portrait.....	45
Special Brands.....	46
The W. Bingham Company's Catalogue.....	49
Price-Lists, Circulars, &c.....	49
Annual Outing of the Chicago Retail Hardware Association.....	50
Requests for Catalogues, &c.....	51
Trade Items.....	51
British Letter.....	52
A Pipe Rack for Displaying Kitchen Utensils. Illus....	52
Among the Hardware Trade.....	53
Aluminum Dripping and Plating Baskets.....	53
Simplex, Pendulum Model, Time Recorder. Illustrated.	53
Soapstone Boot Dryer. Illustrated.....	53
The Corbin Concealed Transom Opener. Illustrated....	54
The K. & B. Box Opener. Illustrated.....	55
Griffon Razor Stroppler. Illustrated.....	55
The Degge Air Diffuser. Illustrated.....	56
Dudley's Combination Wrench. Illustrated.....	56
Keystone Crocodile Wrenches. Illustrated.....	56
The Wilcox Gravity Door Bolt and Latch. Illustrated..	56
Current Hardware Prices.....	57
Current Metal Prices.....	64



## AMONG THE HARDWARE TRADE.

Stearns Hardware Company, Port Arthur, Texas, have been incorporated with a capital stock of \$25,000 to carry on the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Harness, &c. The officers of the company are Geo. R. Stearns, president; S. R. Hogaboom, vice-president and general manager; J. C. Reynolds, secretary, and Chas. F. Ashley, treasurer.

Thos. Mankey & Co. are successors to N. H. Peterson in the Hardware, Stove, plumbing and gas fitting business in Newell, Iowa.

O. B. Adlerman & Son, Maxwell, Iowa, have been succeeded by W. H. Stewart, who will continue the retail Hardware business at the old stand.

C. W. Cook and F. H. Thwing, formerly of Oklahoma City, O. T., have purchased the Shawnee Hardware Company's stock in Shawnee, and will continue the business under the style of C. W. Cook & Co.

Edward Kennedy has lately opened up in the Shelf and Heavy Hardware, Stove and Agricultural Implement business in Cato, N. Y.

M. E. Howerly & Son is the style of a concern who have recently embarked in the Shelf and Heavy Hardware, Stove and Sporting Goods business in Penfield, Ill.

Dern & Son, Prairie Depot, Ohio, have disposed of their business to T. E. Frisbie, who will continue it under the style of the Cash Hardware Store.

Gross Hardware & Furniture Company, Gross, Neb., have been succeeded by Stein & Sellers, who are occupying a new building, the old quarters occupied by the Gross Company having been destroyed by fire.

Union Hardware Company, Arkansas City, Kan., have changed their style to the Hamilton Hardware Company and increased the capital stock from \$5000 to \$10,000. The company are retailers of Shelf and Heavy Hardware, Stoves and Tinware. There is also a department devoted to plumbing.

Joseph Lissner has bought out his partner in the Hardware firm of Lissner & Behler, Tingley, Iowa, and will continue under his own name.

Franz-Howell Hardware Company, dealers in General Hardware and Mine Supplies, Webb City, Mo., have moved into larger quarters.

H. Gilsdorf & Co., Hardware, Stove and Agricultural Implement merchants, Lawrence, Neb., were burned out a short time since. They are putting up a new building and will continue in business.

Schrader & Krieger, Hardware, Stove and Implement merchants, Batesville, Ind., have dissolved partnership. The business has been divided, and H. F. E. Schrader will hereafter run the Hardware part and William Krieger the department embracing Farm Implements and Machinery.

Pool & Hart, Hardware dealers, Hartsville, Mo., have been succeeded by Pool & Shaver.

Reynoldson Bros., Hardware merchants, Manson, Iowa, suffered slight damage from fire a short time since. Business continued without interruption, and the small loss has been satisfactorily settled.

THE BRUNHOFF MFG. COMPANY, Ninth street and Freeman avenue, Cincinnati, Ohio, are making a line of

Hardware Specialties principally intended for advertising purposes. They advise us that their combination Cork Pullers, Ice Picks and Box Openers are meeting with much favor at the hands of the trade. The company will add to their line from time to time such goods as combine utility and originality.

## MISCELLANEOUS NOTE.

### Aluminum Dripping and Plating Baskets.

In the illustrated description of aluminum dripping and plating baskets which appeared in *The Iron Age* of July 10, 1902, a typographical error occurred. It is there stated, in construction of the baskets, "that neither iron, brass nor copper wire is used." It should read, "that either iron, brass and copper wire is used."

### Simplex, Pendulum Model, Time Recorder.

The new model Simplex recorder, manufactured by the Simplex Time Recorder Company, Incorporated, of Gardner, Mass., provides a most satisfactory system of keeping the time of employees. In order to register it



Simplex, Pendulum Model, Time Recorder.

is only necessary to push a button bearing the number of the employee. The construction is such that every button is locked, except the one in use, thereby preventing one person registering for another without a separate ring of the alarm gong. This recorder requires no keys, cards, ink ribbon, type wheels or "in" and "out" levers, and will handle 100 men in one minute. It is made in three sizes, for 30, 50 and 100 men, the largest size taking a wall space 15 x 42 inches. The clock is a Seth Thomas, 15 day, pendulum movement.

### Soapstone Boot Dryer.

The accompanying cuts represent a soapstone boot dryer manufactured by the Pike Mfg. Company, Pike Station, N. H., with New York office at 151 Chambers

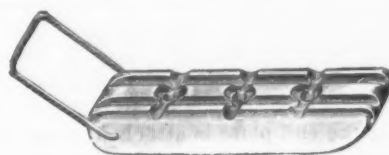


Fig. 1.—Soapstone Boot Dryer.

street. The dryer is put on a stove until warm and then placed in the boot, as shown in Fig. 2. It is explained that the soapstone of which the dryer is made retains heat for a long time and dries the boot without injuring the leather, rubber or the lining, and that the dryer will last indefinitely. The grooves in the bottom of the dryer and the holes through the center are for the circulation of air. The manufacturers remark that there is

nothing they know of more difficult to dry than a rubber boot, and that the dryer does it quickly and effectually. It is recommended for use by lumbermen, fisher-



Fig. 2.—Soapstone Dryer in Boot.

men and by all classes who wear boots, overshoes or rubbers.

### The Corbin Concealed Transom Opener.

P. & F. Corbin, New Britain, Conn., are offering the transom opener, shown herewith. In applying the opener a track is set in the transom frame under the stop, flush

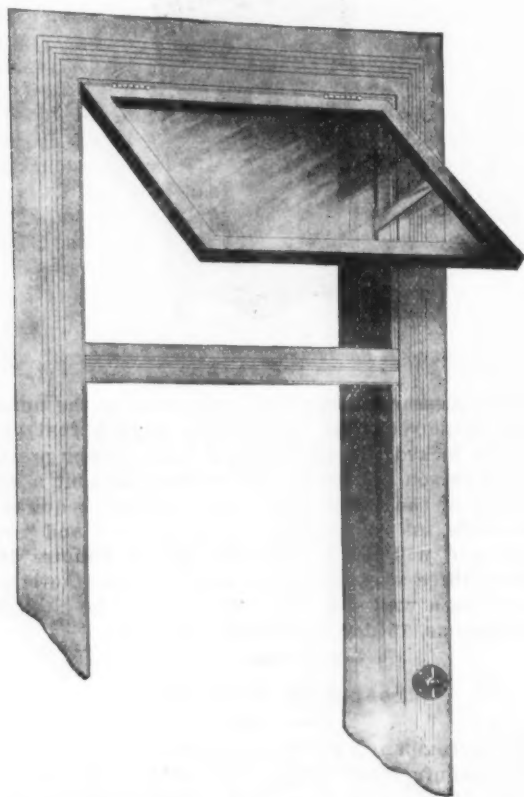


Fig. 1.—The Corbin Concealed Transom Opener.

with the surface of the frame. The gear is placed within the door or window frame at the proper point and the handle attached. The stop is recessed to receive the rod and the end plate is attached to the sash. The lower end of the rod is engaged by a gear, which is connected with the handle pinion. As the handle is turned the rod is raised or lowered and the motion is communicated to the transom. The weight of the opened transom is sustained by the gears and the pressure upon the handle, it is explained, is practically uniform at all times, making it easy to operate. Five revolutions of the handle fully open the transom and locks the sash at 10, 20 or 40 points, as desired. When the transom is closed nothing is seen but the bronze metal handle on the side of the door or window casing.

When the transom is opened a flat steel bar or arm appears, supporting the sash at one end. This, with the end plate or socket, is all that is seen, a fact of distinct advantage, it is shown, particularly where used with fine wood or cabinet work. At the upper end of the rod a guide slides up and down in a track and is connected with an arm, the outer end of which termi-

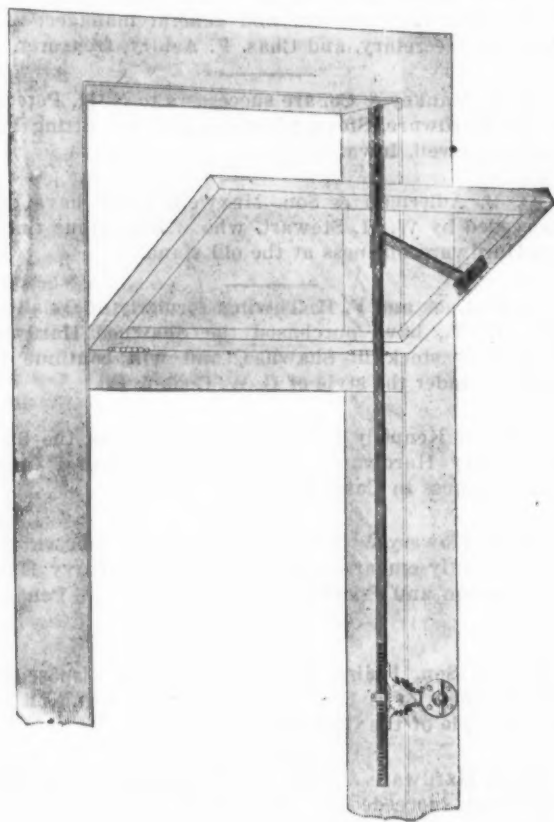


Fig. 2.—Mechanism of Corbin Transom Opener.

nates in a plate attached to the transom. As the slide is moved up and down, by raising and lowering the rod the arm opens and closes the transom. There are no angles and turns in the arm, resulting, it is remarked, in an increased rigidity and evenness of action, a greater strength and more direct application. It is stated that one lifter will answer for all sizes of transoms, hung from either top or bottom, and is perfectly adapted to all needs. For transoms hung on centers the only change required is a shortening of the arm or link. By a reversal of parts it will swing a transom either in or out, hinged from either top or bottom, and can be at-

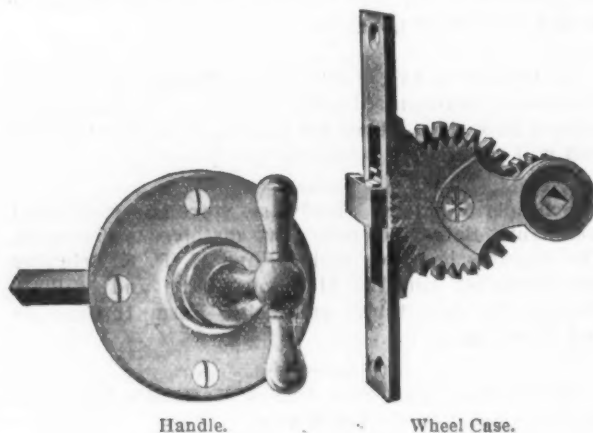


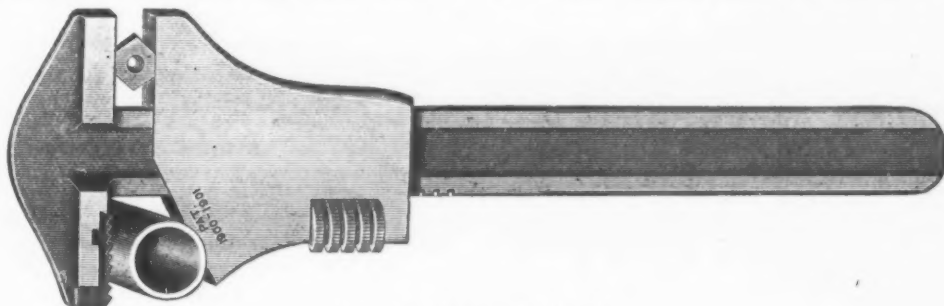
Fig. 3.—Working Parts of Transom Opener.

tached to transoms over windows hung on weights as well as over doors. The adjusting device in the gear permits the handle to be set in the center of the casing, the adjustment of the lifter, as regularly made, ranging from  $\frac{7}{8}$  to  $2\frac{5}{8}$  inches from the face of the frame to the center of the casing or handle plate.



### Dudly's Combination Wrench

The A. Dudley Mfg. Company, Menominee, Mich., are placing on the market the combination wrench shown herewith. It is made of steel and the working parts carefully tempered. The upper jaw of the pipe wrench is interchangeable and can be replaced when necessary. The wrench is referred to as having a sure



Dudly's Combination Wrench.

grip and quick release, as holding pipe, rods, studs and square or hexagon nuts, and as being adapted to the use of steam fitters, plumbers, machinists, miners, engineers and engine builders. The wrenches are made in four sizes: No. 1, 12-inch, with interchangeable jaw; No. 2, 12-inch, without interchangeable jaw; one 7 and one 9 inch automobile wrenches.

### Griffon Razor Stropper.

The Griffon Cutlery Company, 459-461 Broadway, New York, have just brought out the Griffon razor stropper, here illustrated, supplementing a large line of

tion of which blades of varying widths are automatically held rigidly in place. This device is designed for the individual who is not possessed of the knack of skillfully stropping a razor, and who prefers to shave himself, but whose inaptitude in this particular acts as a bar. The simple mechanism is such that by merely holding the apparatus firmly against the strop, as in Fig. 2, and moving it back and forth, the friction on the two

rollers automatically turns the blade in the opposite direction stropping the blade diagonally at each stroke.

H. D. Taylor Company, Buffalo, N. Y., have been incorporated with a capital stock of \$120,000. The officers of the new company are E. I. Taylor, president; I. T. Wettlaufer, vice-president; James H. Harrison, treasurer, and Geo. C. Finley, secretary. The company succeed to the wholesale Carriage and Heavy Hardware business of H. D. Taylor, established in 1835. The warehouse is located at 101 to 105 Oak street.

Currie Company, wholesale and retail Hardware,

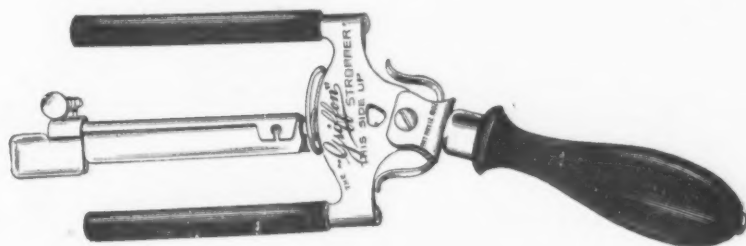


Fig. 1.—Griffon Razor Stropper.

the Griffon brand in the way of knives, shears, scissors, razors, plain and safety, &c. The metallic portion of the stropper is nickeled, the hard wood handle and friction rollers ebonized, and the length over all is 9 inches,

Stoves, Sporting Goods, plumbing, steam and gas fitting, &c., Atlantic City, N. J., are erecting a fire proof storehouse, four stories high, 50 x 105 feet. The new building adjoins their Atlantic avenue establishment in the

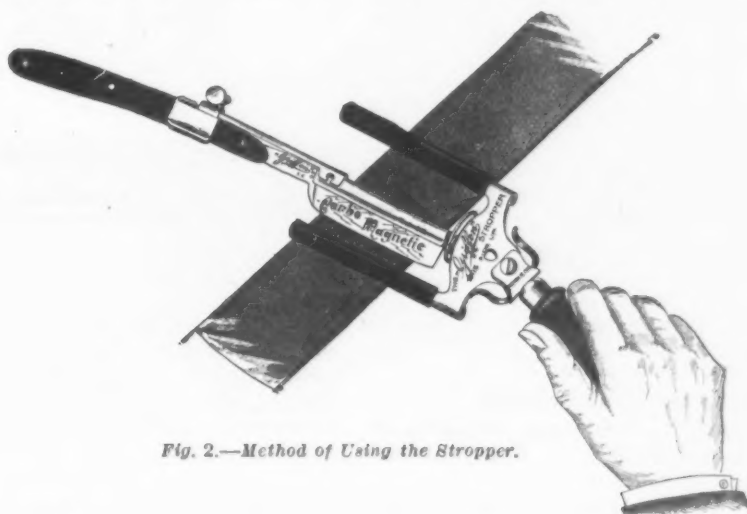


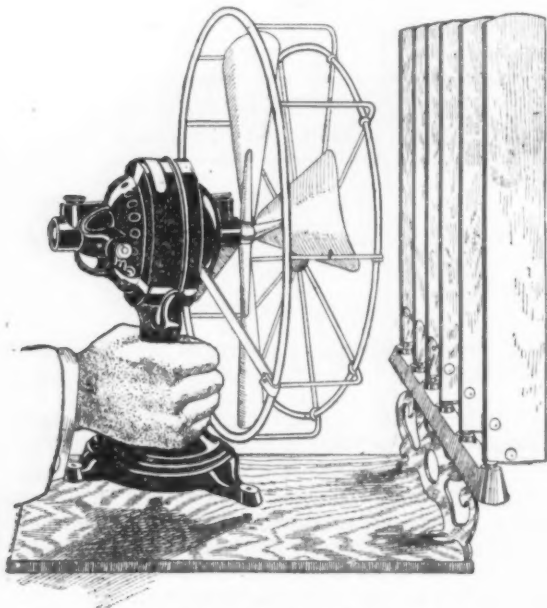
Fig. 2.—Method of Using the Stropper.

as seen in Fig. 1. When the extension clamp to steady the razor handle by means of an adjusting screw is drawn out it increases the total length  $2\frac{1}{2}$  inches. On the inner side of the center section holding the back of the razor blade is a curved flat steel spring, by the ac-

rear. When improvements are completed the company believe that they will have one of the largest and best equipped stores of the kind in the State. The dimensions of the salesroom on the first floor will then be 50 x 205 feet.

### The Degge Air Diffuser.

The air diffuser, shown herewith is for use in connection with electric fans. The castings are nickel plated and the blades are of Spanish cedar. The diffuser is designed to control the draft from the fan, and while in no way lessening the power of the fan in projecting its current of air, it is remarked the blades



The Degge Air Diffuser.

may be turned so as to spread the current over a wide space, or diffuse it over the entire room, and agitate the air as far as the power of the fan may be able to send it; or the current may be concentrated at any point. The diffuser may be attached to any fan, it is stated; also that it is neat in appearance, simple and effective. The device is offered by Degge & Musick, St. Louis, Mo.

### The K. & B. Box Opener.

The Kilborn & Bishop Company, New Haven, Conn., are placing on the market the tool shown herewith, which is for use as a combination box opener, nail puller, hammer and hatchet. The tool is designed for hard usage, being made of one piece of drop forged steel of extra quality. The head is tempered and polished. It is 10 inches long with a head 3 inches wide. The manufacturers state that it is particularly adapted for open-



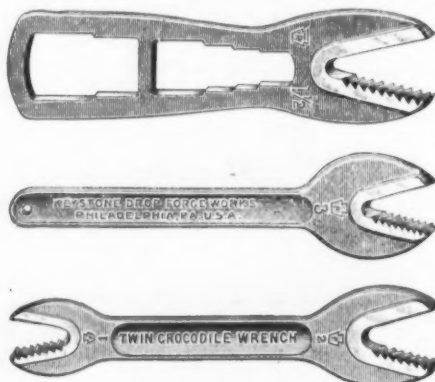
The K. & B. Box Opener.

ing light boxes, such as fruit crates, shoe boxes, barrels, &c.

### Keystone Crocodile Wrenches.

The Keystone Drop Forge Company, Philadelphia, Pa., are placing on the market a new line of steel drop forged wrenches, known as the Keystone Crocodile wrenches, which we illustrate herewith. These wrenches, they advise us, are drop forged from the same grade of pipe wrench steel as is used in other patented wrenches, and which permits of the jaws being tempered and hardened without danger of the teeth either flaking or crushing, as would be the case if such goods were made from a grade of steel in which the carbon was unevenly

distributed. The handles are designed with a flute on each side, thereby giving a better grip to the fingers of the user as well as a broader edge for the resistance

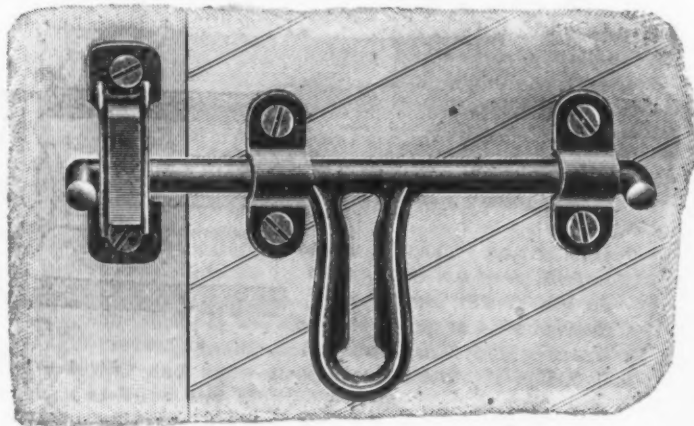


Keystone Crocodile Wrenches.

against the hand. Another feature of these goods is that they are made solid throughout and not built up by welding a handle to the head and welding an inserted tool steel jaw to a soft steel head. The wrenches are being made in three styles, as shown by the cuts. No. 1½ is 5¼ inches long; Nos. 2, 3, 4, 4½ and 5 range from 9 to 27 inches long and are made with a solid handle. The twin wrench is made only in 10-inch length.

### The Wilcox Gravity Door Bolt and Latch.

The Wilcox Mfg. Company, Aurora, Ill., are introducing the gravity door bolt and latch shown herewith.



The Wilcox Gravity Door Bolt and Latch.

The bolt is made of malleable iron—consequently unbreakable—each weighing over 1 pound, suitable for

sliding or swinging doors. It can be applied inside or outside as desired, and is either right or left hand. The bolt is now made in one size, ½ inch in diameter, 8½ inches long, but the company propose making these bolts in three sizes, the smallest size for house doors, and especially for closet, toilet room doors, &c.

N. W. Deering & Son have succeeded G. H. Thornley in the Hardware, Stove and Tinware business in Atlantic, Iowa. Mr. Deering was identified with the Hardware business in Iowa 20 years ago, but went to Florida in 1888, opening a store in Quincy of that State. This business was disposed of to Trulack Bros. in the early part of the present year.